PROJECTIONIST

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JUNE 1954

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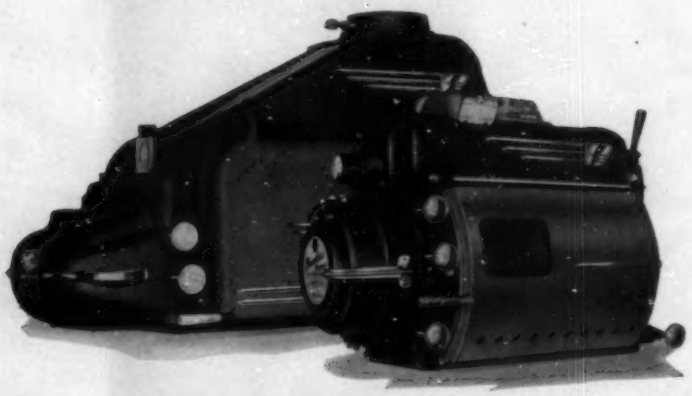

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INTERNATIONAL PROJECTIONIST

With Which Is Combined PROJECTION ENGINEERING

JAMES J. FINN, *Editor*

JAMES MORRIS, *Associate Editor*

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MONTHLY CHAT

MUCH criticism from other than projectionists has been leveled at IP because of its consistent opposition to the system of magnetic sound reproduction. IP has and does now contend that from the moment a magnetic sound track is threaded in the projector, deterioration of sound quality is emphatically noticeable.

It is easy enough to toss opinion upon the wind; but the results of an impartial test just concluded by IP sustain our position in this respect. There is available conclusive evidence that no magnetic recording print will run more than 200 hours from birth to death without serious impairment of sound quality. Moreover, as IP pointed out recently, there are side effects of this magnetic film process—the depositing of the iron filings with which magnetic prints are treated all over the projector mechanism, with especial significance to the coating deposited on the back element of the projection lens.

Magnetic Reproducer Wear

Never mentioned by the proponents of magnetic sound reproduction is the problem arising when the reproducer head is wider than the sound track; less difficult but no less significant, is the situation wherein the sound track is wider than the reproducing head. In the first case, the groove is likely to be worn; in the second case, the head wears fairly evenly all over. But in either event, the necessity for replacement of the reproducing head (not to mention the short life of the print) is imperative if acceptable sound reproducing quality is to be maintained. We quote from the laboratory report to IP:

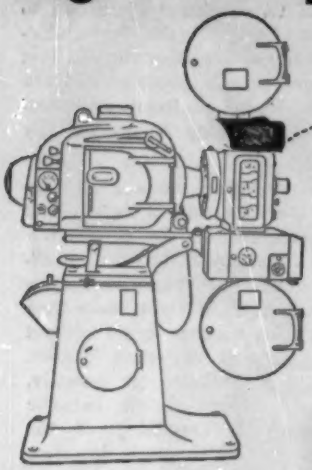
"Laboratory tests on a commercial type, four-track magnetic head which is widely used in CinemaScope installations indicate definitely that the head is good for approximately 1¼ million feet of running film, or about 240 hours. The life of magnetic sound reproducing heads depends, to a certain extent, upon the design of the film-pulling mechanism, on the tension in the film as it passes over the head, and on the film wrap around the head. The latter is, of course, a matter of manufacturer design.

Proper Film Tension

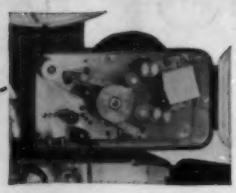
"It should be pointed out here that the location of the CinemaScope tracks adjacent to the sprocket holes appears to call for a higher film tension than is the case where the tracks are removed

(Continued on page 34)

Westrex has a complete line of magnetic equipment for studios and theatres



R9 Reproducer, installed between upper magazine and projector mechanism, operates with any modern projector or sound head.



Westrex R9 Stereophonic Reproducer is a simple, high quality mechanism for reproducing quality stereophonic sound in theatres.

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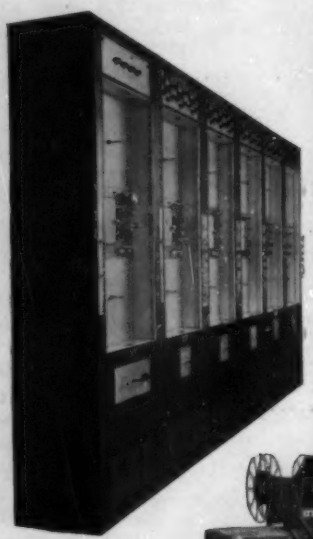
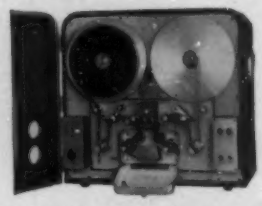
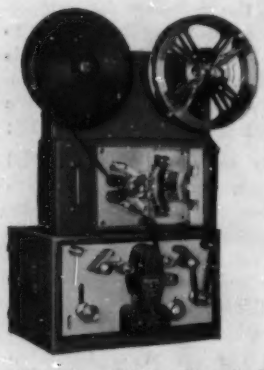
For recording, re-recording, editing, electrical printing, and reproducing stereophonic sound at its best, Westrex offers a complete line of multiple track magnetic equipment of advanced design. Representative models of magnetic equipment shown on this page are in addition to Westrex photographic equipment for studios and theatres.



Westrex Electrical Printer simultaneously makes duplicates of original four-track magnetic recordings as required by individual studios.



Westrex RA-1517B Stereo-Recorder, with its very low flutter content and high volume range and signal-to-noise ratio, is today's quality portable triple-track stereo-magnetic recorder.



Westrex "Pent House" Stereo Magnetic Recorder modifies an existing single track recorder to provide both single track magnetic and multiple stereo-track magnetic recording.

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INTERNATIONAL PROJECTIONIST

VOLUME XXIX JUNE 1954 NUMBER 6

One Down — Much More to Go

By JAMES J. FINN

THE LONE voice of IP pleading amid a welter of silence from all other organs of printed expression in this industry for a sane approach to technological standards swelled to a chorus of approval by a large segment of the exhibition field at the recent round-table forum called by Fox under extreme pressure and attended by more than 1000 exhibitors from every section of the U. S.

Net result: the surrender on a wide front by 20th Century-Fox of its self-assumed prerogative to dictate to the exhibition field the manner in which 20th-Fox productions could be shown. Finale: announcement by 20th-Fox that in future it will supply CinemaScope and regular release prints in four different versions, as follows:

1. Four-track magnetic stereophonic sound;
2. Single-track magnetic sound;
3. Single-track optical sound (the foregoing requiring the use of anamorphic lens attachment and that which 20th-Fox describes as the "proper" screen);

AND

4. Present-standard, 3 x 4-proportion prints with single-track optical sound.

Break Product Bottleneck

Simultaneously, Metro-Goldwyn-Mayer abandoned its requirement for stereophonic reproduction of its C'Scope releases.

This joint 20th Fox-Metro move insures that any theatre anywhere in the world may play *all* the product of the major producers without recourse to special and highly expensive equipment; while those theatres that already have the full complement of equipment will continue to be serviced with prints for multi-channel reproduction.

Single-Track Reproduction

This latter group was the source of some rather tart comment at the 20th-Fox exhibitor forum on the basis that their "adventurous" spirit in moving early to install multi-channel systems had been "washed out" by the 20th Fox-Metro decision, thus destroying their "competitive advantage" and permitting their more cautious brethern to "walk out of the forum with the bacon".

20th Fox met this sally by insisting that the moviegoing public has now been "educated" to "true stereophonic" sound reproduction and would bestow its patronage on those houses equipped for this medium.

Apropos the single-track magnetic sound prints, a theatre which has not yet installed *any* new equipment may avail itself of such prints by the addition of a pickup head and a preamplifier for reproduction through a single speaker. Of course, without the addition of a modern speaker, such a theatre might just as well settle for the single-track optical sound print.

As between the single-track magnetic and the single-track optical sound there exists a wide variance of opinion even among ranking technicians as to their respective merits. The expense factor would seem to be controlling.

Of the four release prints previously listed, it is understood of course that the first three named are CinemaScope prints and require an anamorphic lens for their exhibition. As to the "proper screen" suggested by 20th-Fox, there is a growing tendency within exhibition circles to disregard this recommendation and to revert to a *flat* matte screen. Curved screens are steadily falling into disrepute in the exhibition field.

Small Exhibitors Relieved

The availability of 20th-Fox productions in standard 3 x 4 proportions is the best news received in many months by thousands of small theatres which cannot afford any sizeable money outlay and which have heretofore been shut off from Fox product.

There is not the slightest inclination on the part of IP to ballyhoo its single-

handed press battle against the inflexible demand by 20th-Fox that its product be given the full stereophonic sound treatment in theatres. IP reported and discussed the facts in this situation as it saw them—and the two major premises of its opposition to the 20th-Fox demands were the cost factor and a deep-seated conviction as to the advantage conferred upon any picture by stereophonic reproduction, especially in the smaller theatres wherein screen width was restricted by the physical characteristics of the structure.

Many good friends of IP—including both professional engineers and projectionists—have indicated their preference for stereophonic sound reproduction in any size theatre, their stand being based on the "naturalness" of the sound reproduction, irrespective of auditorium size or structural characteristics. This may be; but on the basis of a comparative test between multiple-track and single-track optical reproduction, the latter employing an "integrator" which shunts the sound to the various speakers, IP was unable to detect any pronounced difference in quality.

Magnetic Pickup Head Wear

Moreover, wear on the magnetic pickup head is continuous, resulting in rapid deterioration of the pickup surface and a steady decline in sound quality during the process. Then there is the matter of the filings which peel off the magnetic film striping and are deposited all over the projector head, especially on the back element of the lens, necessitating constant cleaning. A worn magnetic pickup head, like an old shoe, may only be thrown away.

Several top-flight engineering organizations are now engaged in a frantic search for the answer to this "peeling" problem. IP has no doubt that in time these fellows will come up with the answer; but this report is concerned with the ever-present, not the indeterminate future.

Relative to screens, IP realizes that a metallized surface was necessary for showing 3-D releases, but it has consistently and vigorously opposed the use of such a screen for other than 3-D releases. The 3-D horizon at the moment is gray indeed, if not black, and the thousands of theatres who invested in such screens now have ample reason for regretting their precipitate haste in this direction. Such regret neither recoups their financial loss nor removes the screen from their theatres.

"Curved" Screens Disapproved

As for "curved" screens of whatever character, IP has always regarded them as the veriest nonsense, for reasons which have been detailed repeatedly herein. Curved screens are not only a perversion of the basic principles of good projection but they also occasion an economic loss by rendering useless a not inconsiderable number of side seats.

IP has always held that these "special" screens were phony, and widespread realization of this fact is now apparent not only among projectionists but among those manufacturers who have the continuing welfare of the industry at heart as opposed to the policy of putting over anything and everything for the sake of turning a "fast buck".

In the forefront of those offering vigorous opposition to these "special" screens, the use of which was demanded "or else" by CinemaScope proponents, are the manufacturers of arclamps who are incensed at propoganda that the use of a "special" screen obviates the need for the powerful arclamps now available.

For many months the lamp manufacturers have fought this battle behind the scenes, but the matter has now exploded into open war by forthright declarations by the manufacturers in the editorial and advertising columns of the trade press, which, with the sole exception of IP, has been ignorant of or chose to "play safe" on this vitally important topic.

A notable example of aroused manufacturer ire is on view in this issue of IP, wherein in some of the most forthright and refreshing language ever employed in technical advertising copy a lamp manufacturer brands as "fallacies" the theories advanced by the proponents of "special" screens and commiserates with those exhibitors who "fell" for such theories and thus "found themselves betrayed."

Flat Matte Screen Endorsed

The manufacturer cites how his lamp, burning at 135 amperes, produces 16,000 lumens to the screen through CinemaScope aperture and an anamorphic lens *with the shutter running* and achieves 15 foot-lamberts at the center of a matte white screen 50 feet wide by 19½ feet high! Comparison of these figures with the SMPTE standard of 9 to 14 foot-lamberts is made.

Now, there is no doubt whatever that a flat matte white screen affords maximum light distribution throughout the theatre, as is conclusively demonstrated at the Radio City Music Hall in New York, world's largest theatre, which recently installed a flat matte white screen for *all* film presentations. But it is equally true that a matte screen requires more light to be projected thereon in order to equal the output of other types of screens. So what? There is no lack of powerful projection light sources of various amperage ranges, the price of which is small indeed when compared with the huge expenditures already made for excess equipment.

Curious it is that when the proponents of CinemaScope were throwing their weight around and dictating what an exhibitor might or might not do, they were strangely silent anent the advantages of a new and more powerful projection light source.

Still a most pressing projection problem is the matter of aspect ratios, with not a word emanating from 20th-Fox to indicate that it has any intention of receding from its firm stand in favor of the 2.55-to-1 proportion. IP has always been and will always be opposed to this aspect ratio, for reasons set forth on numerous occasions in these pages. The 2-to-1 ratio is the extreme limit we would favor, while preferring the 1.85-to-1 proportion.

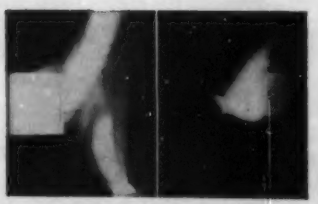
(Continued on page 33)

Exhibs Want Stereo Money Back

A new twist to the slightly muddled technological exhibition picture was provided recently when the North Central Allied exhibitor group, through its executive counsel S. D. Kane, reported a "sizeable number" of its exhibitor members who installed stereophonic sound now want 20th-Fox to reimburse them for the equipment "which has become unnecessary". Kane, who is looking into the legal aspects of the situation, stated:

"The representation was made that exhibitors only could obtain 'The Robe' and other CinemaScope pictures by installing stereophonic sound." This, it now develops, was a misrepresentation. "The exhibitors proceeded and made substantial investments on such a misrepresentation. We now want to determine if Fox is legally liable for the unnecessary expenditures."

Hitch your bandwagon to a brighter star with NATIONAL TRADE-MARK CARBONS



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WITH THE LATEST impressive developments in wide-screen, 3-D and stereophonic sound, with the flurry of new stars and *really* better movies, exhibitors have more to work for—and more to work *with*—than ever before. In *your* efforts to capitalize on the new projection techniques, don't overlook these important facts:

THE PICTURE IS LIGHT – This is a fact exhibitors should know and remember. Every tone of light and shadow, every hue and shade of color on the screen are contained in the light *behind* the film. The film itself cannot *add to* the picture. It creates the screen-image only by filtering or *holding back* certain elements of the projection light.

LOW-COST IMPROVEMENT – Your "National" carbons deliver maximum screen-light at, or near, maximum recommended operating currents. ***Only by operating at peak current can you get all the screen light your present equipment is capable of delivering.*** So, while you're figuring new lamps or awaiting delivery, don't miss this inexpensive means of improving your position in a highly competitive market. *Light* is box office, too!

The Anatomy of CinemaScope

By ROBERT A. MITCHELL

The concluding article of two which discuss the width, size and over-all pictorial composition of the wide-screen image.

USERS of mechanisms having rear- and front-shutter combinations will find that the front-shutter component must be removed to make room for the anamorphic-lens attachment. We have found that no change in picture-quality occurs when the front shutter is discarded, confirming our frequently expressed opinion that the rear- and- front combination was devised merely as a selling-point.

Anamorphic History

The anamorphic lens on which CinemaScope depends has an extensive history. "Squeezing up" the pictures on the film and then expanding them on the screen is an old trick of the optician's art. Professor Ernst Abbe, one of the founders of the German optical firm of Carl Zeiss, and Dr. P. Rudolph, director of the photographic division of the Zeiss works, devoted attention to anamorphic optics even before the turn of the century. An anamorphic lens computed by Dr. Rudolph was produced in 1897. This was probably the first lens of this type ever made.

More than two decades ago, Professor Henri Chretien of Paris, basing his work on that of Rudolph, designed and produced anamorphic objectives in an effort to obtain wider fields in motion picture projection. It was not until 1952, however, that the motion picture industry became sufficiently interested in the system to invest heavily therein. To 20th Century-Fox go the laurels for pioneering the anamorphic wide-screen process commercially.

The principles involved in anamorphic optics were ably described by Chretien and IP's editorial staff in IP for June 1953 (page 14).

Anamorphotic projection lenses may be either *complete* lenses or merely "hypergonar" attachments which slip on over the barrels of the regular lenses. CinemaScope utilizes hypergonars designed by Professor Chretien and first manufactured in quantity by Bausch & Lomb. Distribution of these attachments, like that of magnetic "penthouse" stereosound reproducers, amplifiers, speakers, screens, and other CinemaScope accessories, was at the outset rigidly controlled by 20th-Fox.

Lens Performance

The performance of CinemaScope hypergonars is usually fair, but by no means perfect. The projection hypergonars have been quite uniform in quality, but their performance has often been marred by residual aberrations which result in a blurring of the picture in substantial areas at each side of the screen. Close inspection of CinemaScope images reveals that these aberrations are largely chromatic, for purple and yellow-green fringes border the vertical edges of objects.

Minor divergencies from the standard extension-factor of two have been noticed in camera hypergonars, resulting in very slight abnormalities in the width of objects reproduced on the screen. The quality of camera hypergonars seems to be somewhat better than that of the projection attachments.

It is true that doubling the horizontal dimension of the screen-image magnifies the grain of the film-emulsion; but it has been pretty well established that this effect is a minor one in the overall problem of CinemaScope image-definition. The greatest care has been taken in all CinemaScope features and short subjects to have the images as sharp as the resolving power of the film emulsion allows. Technicolor dye-imbibition prints, having comparatively low definition, have not been used until recently.

High Print Cost

The so-called "Technicolor" CinemaScope prints released to date have actually been Eastman Color positives of the photographic, or multilayer dye-coupler type, processed in Technicolor's increasingly versatile laboratories. This is a matter of great concern to the producers of CinemaScope pictures because, even though the resolving power of photographic color film such as Eastman Color, Ansco Color, Agfacolor, Pathecolor, Gevacolor, etc., is practically as good as that of black-and-white film, the prints cost about 1½ cents more per foot than imbibition prints and create processing bottlenecks. So serious has the situation become—a situation aggravated by the short life of CinemaScope prints—that 20th Century-Fox is turning to Technicolor imbibition prints, presumably for foreign release.

Even though the use of imbibition printing will reduce the cost of CinemaScope color processing from about 6½ cents when Eastman Color is used to slightly less than 5 cents per foot, magnetic stereosound makes CinemaScope footage unavoidably expensive. Magnetic striping of the film is reported to cost about 4 cents per foot, and the recording of sound in each print plus incidental expenses comes to about 1½ cents. It all adds up to 12 cents per foot for the completed release prints on Eastman Color positive.

The high mortality rate of CinemaScope prints is due primarily to two factors, deterioration of the magnetic

So They Say . . .

an-a-mor'phism, *n.* 1. A distorted image of any object.
2. In biology, a gradual change from one type to another, generally from lower to higher.

an-a-mor'phō-scope, *n.* [Gr. *anamorphōsis; ana*, again, *morphē*, form, and *skopos*, a watcher, from *skopeîn*, to see.] A vertical cylindrical mirror, which destroys anamorphosis and gives a correct representation of the object mirrored.

an-a-mor'phō-sis (*or* -mor-phō'-) *n.* [Gr. *anamorphōsis*, a forming anew, from *ana*, again, and *morphoun*, to form.]
1. In perspective, a deformed or distorted portrait or figure which, in one point of view, is confused or unintelligible, and in another is an exact and regular representation; or which is confused to the naked eye, but, reflected from a plain or curved mirror, appears regular and in right proportion.
2. In biology, a gradual change of form to a higher type.

an-a-mor'phō-sy, *n.* Same as *Anamorphosis.*

Anamorphosis.

DON'T BE SOLD A BILL OF GOODS!

The proponents of CinemaScope insist that the light distribution at all viewing angles to the screen, and across the screen, be uniform throughout the theatre. That the only way to accomplish this result is with a "special" high reflective screen is not true.

YOU DO NOT NEED TO BUY ONE OF THE NEW "SPECIAL" SCREENS FOR CINEMASCOPE IF YOU HAVE *Strong* SUPER "135" PROJECTION ARC LAMPS AND YOUR INDOOR SCREEN IS UNDER 50 FEET WIDE!

Experience has proved that uniform light distribution can be accomplished by the use of a matte white screen in conjunction with a good "Strong" lamp. You will have the ultimate in picture brilliance with no perceptible fall-off in efficiency at the sides. It is a fact universally accepted by leading motion picture engineers that no screen equals a matte white screen for affording maximum light distribution throughout the theatre.

HERE'S PROOF!

A Super "135" Lamp, burning at 135 amperes, projects 16,000 lumens to the screen through a CinemaScope aperture and an anamorphic lens with the shutter running, and produces 15 foot lamberts at the center of a matte white screen 50 feet wide by 19½ feet high. *The Society of Motion Picture and Television Engineers' Standard is 9 to 14 foot lamberts* for 35-mm indoor projection. Accordingly, if you have Super "135" lamps, you can use an inexpensive matte screen and get excellent results.

GET THIS STRAIGHT!

Strong does not manufacture screens of any type but does manufacture lamps for efficient use with all types of screens. As a service to the industry we feel that we should explode the fallacies set forth in advertising matter by certain screen manufacturers that with their "special" screens the powerful modern-type projection arc lamps which are made by several dependable lamp manufacturers become unnecessary. The theatre owners who, unfortunately for themselves, fell for this story, have found themselves betrayed.

THE FACTS ARE THAT THE MOST PERFECT CINEMASCOPE PROJECTION IS BEING ACCOMPLISHED WITH THESE MODERN *Strong* LAMPS!

WE'LL BE GLAD TO GIVE YOU A LIST OF THEATRES, IF YOU WANT IT.

THE STRONG ELECTRIC CORPORATION

"The World's Largest Manufacturer of Projection Arc Lamps"

31 City Park Avenue — Toledo 2, Ohio

Which little girl will make it?

All else being equal, she'll be the one on the film which was more carefully selected and processed.

Unless film and handling are technically compatible, skin tones fade and features become wan and haggard—dull and lack-luster. Important this beauty care in the days of black and white . . . vital now *with color.*

To co-operate with the industry in helping solve questions of film selection, processing, and projection, Kodak maintains the Eastman Technical Service for Motion Picture Film. Branches at strategic centers. Inquiries invited.

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342 Madison Avenue	137 North Wabash Avenue	6706 Santa Monica Blvd.
New York 17, N. Y.	Chicago 2, Illinois	Hollywood 38, California

sound and the smaller sprocket-holes. The use of narrower sprocket teeth on projectors fitted for CinemaScope also decreases the life of standard prints by tearing, notching, and "checking" the perforations.

Wear on Perforations

The pulling of the film through "penthouse" soundheads by 16-tooth upper feed sprockets doesn't do the perforations any good. Sprockets of the 24-tooth size are better, and 32-tooth sprockets are better still.

Magnetic sound *recording* is now standard procedure in movie-making. To prepare standard release prints the completed magnetic track is re-recorded optically to obtain the regular photographic-track negative used for release-printing. Magnetic sound, when the tracks are sufficiently wide and the records handled with greater care than can possibly be accorded CinemaScope prints, has the advantages of immediate playback, low noise-level, and high fidelity.

The playing of CinemaScope magnetic tracks in theatres, however, is beset with difficulties almost impossible to eradicate.

Magnetic soundtracks are susceptible to partial erasure and the pickup of ground noise. Projector parts, especially sprockets, idlers, and the magnetic reproducing head itself, must be frequently demagnetized to minimize these troubles. (See "Hints on Handling Magnetic Soundheads," IP for November 1953, page 7.)

Stray Magnetic Fields

Many projectionists m a g n e t i z e screwdrivers to permit easier insertion and removal of machine screws. Such screwdrivers, as well as other tools which have been accidentally magnetized by a severe blow, powerful vibration, or exposure to magnetic fields, impart undesirable magnetism to projector components. Magnetized parts of the reproducer introduce rumbling noises; while magnetized sprockets and idlers often mar the sound with clicks, thumps, buzzes, whistles, hisses, and even noises which resemble the whirring of the intermittent.

These noises, frequently accompanied by the fadeaway of sound, make themselves heard simply because they have become indelibly recorded on the film, especially in the two outside tracks.

Loss of sound and extraneous noises in magnetic tracks are irreparable. It might seem that the tracks could be completely erased and recorded over again; but the inevitable splices in used prints preclude this possibility. 20th Century-Fox has had no alternative but to scrap its garbled prints.

Twentieth-Fox may be sure that *no one* makes splices in CinemaScope film for the hell of it. With the magnetic tracks on the reverse side of the film, it's difficult stuff to splice.

Magnetic-Track Faults

CinemaScope sound also suffers from the narrow width of its tracks (0.063 inch) and rapid wear of the pickup heads. While distortion is of a low order when the pickups are in good shape, wear results in non-linear distortion and serious attenuation of high frequencies, making speech indistinct.

In practice, therefore, it is quite evident that CinemaScope's method of magnetic sound reproduction has vast potentialities of falling far below the high quality of normal photographic sound. The exciting lamp and photoelectric-cell are far from becoming *passe!*

The stereophony of CinemaScope not only leaves much to be desired, but, in the long, narrow type of auditorium, it may actually be unnecessary. The stereophony is admittedly effective when single-source sounds (such as speech) are involved; but loss of volume in one or two of the three tracks has the unpleasant effect of shifting the apparent source of the sound to one side of the screen. As a result, we often hear an actor's dialog booming from the wings like a disembodied voice.

Single-Channel Adapter

A few exhibitors are employing single-channel CinemaScope reproduction. This is done by combining the output of the three tracks in a simple mixer and using the regular theatre amplifier to amplify the combined signals. The mixers used for this purpose are definitely not approved by 20th-Fox execs, who maintain that their sound is ruined and that signals from the three tracks may actually cancel out in the mixer push-pull-wise.

Be that as it may, this writer feels that the expense and sometimes low quality of CinemaScope's stereosound invites exhibitor snubs with every misdirected chirp. It is noteworthy that Warners is issuing its CinemaScoper "The Command" in both single-track optical and multiple-track magnetographic editions.

With the single photographic track, projector apertures having the dimensions 0.825 x 0.715 will be needed. Curiously, this is the same as the old silent-film aperture masked off to cover the soundtrack (standard perforations assumed.)

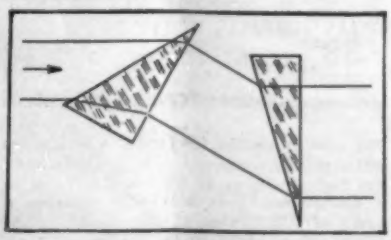
CinemaScope, like 3-D, has been a

(Continued on page 34)

Variable Anamorphic Lens Principle Explained

Projectionists who have been wondering about the operating principle of the variable anamorphic lens attachments recently marketed can satisfy their curiousity by observing the accompanying diagram from *Ideal Kinema*, London, which shows the simple prism arrangement used in a variable anamorphic attachment.

The prisms are arranged so that the parallel light from the regular projections lens strikes the first prism at an angle, and is refracted in the manner shown in the diagram. The beam then becomes wider and strikes the second prism, also at an angle. It is again refracted and expanded. The beam that emerges from the variable anamorphic attachment is parallel to the entering beam but wider, as the diagram shows.



Light beam shown passing through prisms of variable anamorphic lens.

When looking at the diagram remember that you are looking down at the prism arrangement from above. The refracting action of the prisms expands the beam horizontally, or from side-to-side, not vertically or up-and-down. In principle, it is similar to the refracting action in variable anamorphic devices such as the Tushinsky lens attachment proposed for use with VistaVision "squeeze" prints and the Gottschalk Super Panatar attachment.

Tips on Screen Illumination

This article examines the need for increased screen illumination when projecting pictures on large, wide screens. It also warns that shutter blades cannot be trimmed to gain light without reducing picture quality.

WITH the trend toward wide-screen projection still gaining impetus and many small and medium-sized theatres converting their equipment, it is a good time to re-examine some of the fundamentals of *photometry*, the science of measuring light, as they are applied to the motion picture screen. A knowledge of these fundamentals will help the projectionist to understand what can be done and what *cannot* be done to obtain the light necessary for illuminating larger screens.

However, let's not bother with formulas. Readers who want the whole story in an article that is easy to understand are referred to "Photometric Units in Projection" in the September, 1948, issue of IP. Rather, let's take a brief glance at the three light units that are most important to us as projectionists.

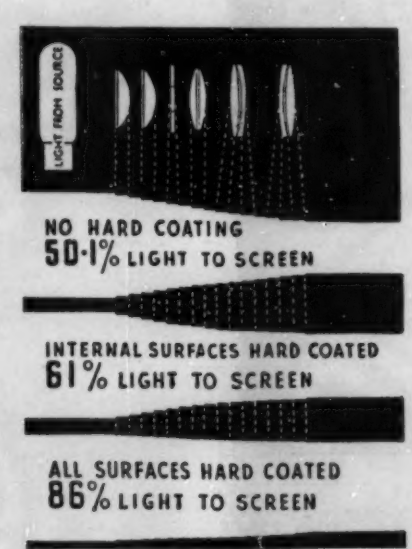
THE LUMEN: The *strength* of a beam of light is measured in lumens. Another way of putting it is that lumens indicate the density of luminous flux, or flow of light. Suppose 10,000 lumens pour from your projection lens when the projector is run without film. The beam is small, and hot enough to burn your hand. But the "spread-out" beam that hits the screen also has 10,000 lumens of light. It is less dense, but much larger in cross-section, and no light has been lost.

Projection 'Throw' Unimportant

This is why the length of projection throw does not enter into screen-illumination problems. All we need to know is how much light leaves the lens and how big the screen is. The screen can be 50 feet away or 200 — it doesn't make a bit of difference in the brightness of the picture if screen size remains the same.

FOOT-CANDLES: The beam of light leaving the projection lens is small and hot. The light is exceedingly intense. At the screen, illuminated by the spread-out beam, the light is much less intense. Now, the intensity of light is measured in foot-candles.

FOOT-LAMBERT: Suppose your screen is old and soiled, and you replace it with a fresh white screen, or have your old screen refinished. The new screen surface gives a brighter picture than the old one, doesn't it? And yet the number of foot-candles impinging upon the screen has not been changed. The brightness of a screen — or any extended surface — is measured in foot-lamberts. If the screen be a perfect diffuser, reflecting *all* of the light falling upon it (no actual screen is quite that good!) the number of foot-candles and the number of foot-lamberts will be identical. But actual screens absorb (or transmit through the sound perforations) about 20 percent of the light, which is wasted because it never reaches the eyes of the audience. So if we want 15 foot-lamberts of brightness, we must figure on a projection-light intensity of 18.75 foot-candles *at the screen* to compensate for the 20 percent loss of light.



The coating on the lenses that you use enables you to employ your optical units with the highest degree of efficiency, in terms of screen lumens. Light losses that occur as a result of reflection at all glass-to-air surfaces inside a lens are graphically presented here. Also shown is the degree to which such losses can be offset with coated lenses.

Candlepower

A fourth useful term is the expressive world "candlepower." If the positive crater of an arc is specified as having a candlepower of 50,000, then we know that it is as bright as 50,000 standard candles packed into a single small area. The higher powered arcs in use today have candlepowers even greater than this!

Here is an interesting point. The *smallest* brightness-difference perceptible by direct side-by-side comparison of two screens lies somewhere between 4 and 5 percent. If one projector in a theatre is brighter or dimmer than the other by an amount not exceeding 5 percent, not even a trained observer would be able to notice the difference at changeovers!

Even the most discriminating patrons are unable to detect on Monday a dimmer or brighter screen than they saw on Sunday unless the brightness be decreased or increased by at least 15 or 20 percent. In fact, patrons are not likely to comment on a brighter picture unless the brightness is practically doubled. To get a "rise" out of them, you must increase your present 10-foot-lambert brightness to 20 foot-lamberts, or your present 25-foot-lambert brightness to 50 foot-lamberts. The gain or loss of 5 or 10 foot-lamberts is hardly noticeable when normal screen-brightness exceeds 40 foot-lamberts. At lower light-levels such a gain or loss would be terrific, naturally.

Matching Arcs for 3-D

As for the matching of projectors for equal light-outputs, we must be mighty fussy when 3-D films are shown. The difference ought to be less than 5 percent, and we can't always hold the difference down as close as we might wish. If the difference in the brightness of the right-eye and left-eye images is considerable, it causes an uncomfortable sensation in the eyes and possibly induces eyestrain.

Suppose your light-output suddenly drops while projecting blank light

to the screen. In such a case we might say that the "tone," or color, of the illumination has changed from white to gray. Now, here is the question: How much does the light have to decrease to change the tone from white to medium gray? About 50 percent? Surprising as it seems, the light-output must drop 84.1 percent in order to produce a tone which, relatively speaking, is medium gray. In other words, if we arbitrarily state that a "white" surface has a brightness of 100 percent, a "medium gray" surface has a brightness of only 15.9 percent. The following list gives the relative brightnesses of an evenly graded series of grays.

White	100.0%
Faint gray	63.1
Pale gray	39.8
Light gray	25.1
Medium gray	15.9
Dusky gray	10.0
Deep gray	6.3
Dark gray	4.0
Dusky black	2.5
Night black	1.6
Absolute black	.0

Shutter Blades

This writer is completely in favor of optical efficiency in projection and wishes to see more light in more theatres. And yet he knows, both by experience and common sense, that projectionists who shave their shutter blades a trifle beyond a safe minimum width in order to gain 2 or 3 or even 4 percent more light are doing worse than merely wasting their time. Why? Picture-quality is imperiled by trimming shutter blades, *and the gain in illumination is too small to be visible even by direct comparison on two screens.* This is not mere theory or opinion. We have made exhaustive tests with a double-field illuminometer, and with all colors of light, including white of different color-temperatures.

If the brightness-difference is too slight to be seen even by the most perceptive observers, that brightness-difference does not exist for all practical projection purposes. In a word, if it can't be seen, it isn't there.

Not only are shutter-shearing projectionists gaining no visible screen-brightness, they are also running the risk of introducing 24-cycle flicker caused by slight differences in the widths of the master and balancing blades, they are making their shutters unfit for use if backlash in the gear-train develops for one reason or another, resulting in both top and bottom ghost-flashing, and they are hazarding the introduction of short travel-ghost haze, or at any rate a trembling of the edges of extremely bright objects in the picture, visible to patrons in front seats if the picture illumination comes up to or exceeds accepted standards.

Travel-ghost Tests

Every projectionist should have a travel-ghost test film. Certain black leaders having the frame-lines indicated by a row of small holes punched out of the film make good test films, and so do plain black-and-white titles with sharply focused lettering. Projectionists who can get a few reels of old silent films in good condition can make up a sizeable roll consisting of nothing but dialogue subtitles.

Traces of ghost, flare, and flickering haze due to imperfect shutter action cannot usually be seen from the projection room through the observation ports. It is always best for the projectionist to examine the test-film image from the stage while an assistant runs the projector. Where this cannot be done, the projectionist should remove the glass from the observation port, turn out the lights in the projection room, and examine the image with binoculars of good quality. The auditorium should be absolutely dark while a test of this nature is being made.

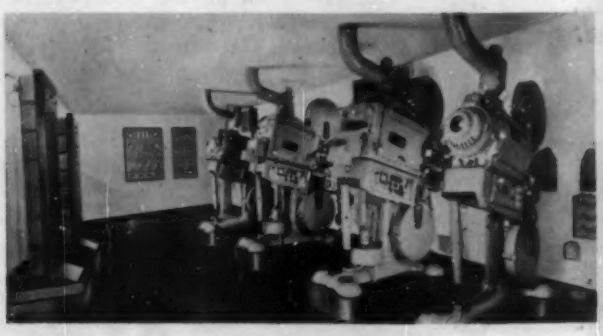
Shutter blades just a trifle too narrow reveal themselves in a rapid trembling of the top and bottom edges of the white letters in titles. The effect is easily seen from the front row of seats; it cannot be seen from the projection room unless the projectionist takes special precautions to insure perfect viewing conditions. We never see the picture as clearly as our audiences do.

The trembling is due to the fact that the film is exposed while the intermittent is just coming to a stop and also just beginning to pull down the next frame. It sometimes helps during this test to reduce persistence of vision temporarily by looking at a bright light before running the test film. When the shutter blades are sufficiently wide, a well-photographed title will be practically indistinguishable from a motionless slide.

Trimming Blades Hazardous

Now, if the shutter blades are a trifle wider than is necessary, so that 2 or 3 or even 4 percent of the light is unnecessarily wasted by them, the loss need not worry the projectionist — it is too small to be appreciable, and the positive gain in picture-steadiness and freedom from flicker, trembling, and travel-ghost flare is too great to sacrifice by shutter-shearing.

Slightly soiled lenses cause a light-loss of from 5 to 10 percent. Add to this similar unnecessary losses from dusty projection-port glasses and badly pitted lamp mirrors, and it can be appreciated that the light-conscious projectionist — a term that happily includes most of us — will concentrate his attention on optical cleanliness and will waste no worry on *imperceptible* losses caused by wide shutter blades which, because of those *imperceptible* light-losses, are contributing very efficiently to perfect clarity of the screen image.



One of the better foreign projection rooms — the Reposi Theatre in Turin, Italy. Projectors are Microtechnica, an Italian make.

Canadians Building 59 Theatres

Recent reports from Canada indicate that 59 theatres are under construction north of the border, 20 auditorium houses and 39 drive-ins. In addition, 17 theatres opened since the beginning of the year, three of them drive-ins.

RCA's Portable 16-mm Arc Projector †

By J. J. HOEHN, A. J. CARDILE and
RALPH A. WOOD

Because of the increasing need for professional-quality projection by industry and by educational, social and religious groups, this article should be of interest to projectionists. They have the experience needed for professional results with the equipment described.

THE RCA Porto-Arc 16-mm projector is designed to provide sufficient light and audio-power output to handle larger screen sizes and audiences than can be accommodated with projectors using conventional incandescent-lamp light sources. The design was made possible by the development of a dual operating-range 16-mm arc lamp and associated rectifiers small and light enough to justify the use of the term "portable."

This lamp has been integrated into an overall projector design which allows the equipment to be separated into readily portable units. For example, the arc lamp is easily disconnected from the projector mechanism, and both units merely lift off the pedestal-amplifier assembly to make sections which can be conveniently handled and transported.

Mechanical Design

Figure 1 shows the Porto-Arc Projector disassembled for transportation. First on the left is the pedestal-amplifier assembly, which is about the size of a large suitcase of conventional proportions.

The second item from the left in Fig. 1 is the portable loudspeaker regularly used with RCA Model 400 16-mm Projectors. The third item is the dual-range arc lamp, and next is its associated rectifier for converting A.C. line power to the low-voltage D.C. required for proper operation of the arc lamp. The fifth and last item is the projector mechanism; reel arms and small accessory items are mounted within its housing. The heaviest items are the pedestal-amplifier and the rectifier, which weigh about 60 pounds each due to the inevitable weight associated with transformers of adequate performance characteristics.

In Operating Position

Figure 2 shows the Porto-Arc Projector set up and operating. The projector mechanism and the arc lamp lock firmly together in correct optical alignment by means of guide pins, locating holes, and an aircraft-type cowl fastener.

The assembled mechanism and lamp rest on the upper surface of the pedestal-amplifier case as shown, supported by the rear arc-lamp feet and by the movable front pins of the tilting device incorporated in the case. The pedestal legs are splayed a considerable degree laterally and longitudinally to provide excellent mechanical stability for the complete projector.

Amplifier System

The pedestal-amplifier assembly has separate compartments to contain its demountable legs and the interconnecting cables, and it also incorporates the 5-degree tilting mechanism in the front operated by a fold-in crank. Adjustable legs accommodate the projector optical axis to existing projection room portholes and "up" or "down" projection angles. All interconnecting cables are provided with suitable plug connectors of a variety of types to prevent incorrect connections. In other words, if the plug on a cable end fits a given socket, it is the *right* plug for that socket.

† Jour. of SMPTE, March, 1954.

FIG. 1. The RCA Porto-Arc 16-mm projector is complete in five carrying cases.

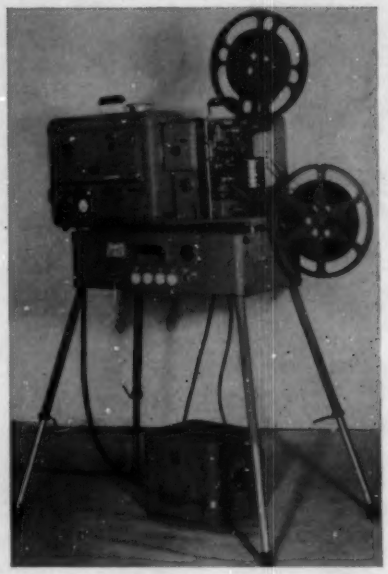


FIG. 2. RCA Porto-Arc in operating position.

Figure 3 is an interior view of the pedestal-amplifier case with the control panel removed to show the amplifier chassis. The amplifier incorporates the same type of high-frequency exciter lamp oscillator and tilt-type tone control used in RCA Model 400 16-mm projectors, but the power output has been increased to 25 watts for the larger audiences which can be served with 16-mm arc projectors. There are individual mixer-type volume controls for the film sound channel, record player and microphone.

The main power circuit to the projector enters via the magnetic circuit breaker at the left end of the amplifier chassis. Its time constant allows for the arc-striking current surge, but it opens before a thermal line fuse of equivalent rating will blow. Accidental overloads therefore operate a protective device at the projector location, and not at some possibly distant or inaccessible point.

Figure 4 is a back view of the pedestal-amplifier case with the cable access door open. The two shielded-cable jacks at the left are for the pro-

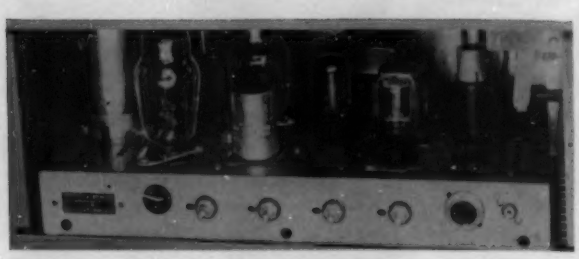


FIG. 3. Pedestal-amplifier case with control panel removed to show amplifier chassis.

jector mechanism phototube and exciter lamp circuits, respectively. The phototube circuit is triple-shielded to prevent interference pickup from the relatively strong fields existing around the arc circuits. The phone jack and pair of terminals to the left of it are both the loudspeaker output circuit from the amplifier so that either temporary or permanent connections can be made.

The multi-terminal strip at the right allows the output impedance to be changed to match the characteristics of the loudspeaker equipment being used. The output circuit from an RCA MI-35102 Magnetic Reproducer Kit in-

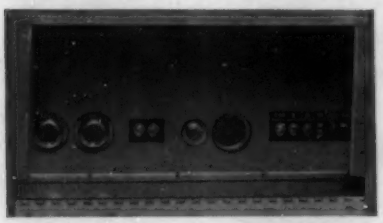


FIG. 4. Rear view of pedestal-amplifier, showing various connections.

stalled in the projector mechanism may be connected to either the microphone input circuit, if both photographic and magnetic sound tracks are to be run, or to the phototube circuit jack in the rear if magnetic tracks only are to be reproduced.

Projector Mechanism

Figure 5 is a close-up of the projector mechanism. Except for certain modifications and additions required by the arc application, it is the same as has been used for some years in RCA Model 400 16-mm projectors. Visible in the figure just above the picture gate assembly is the head of the cowl-lock fastener which locks the mechanism to the lamp. Below and to the left is the theatrical-type framer control knob which shifts the moving film with respect to the aperture, and directly below it is the speed-shift control which changes the film speed from 24 frames per second to 16 frames per second. The motor switch is at the bottom of the control panel.

Since it is impractical to interlock the projector motor and lamp power circuits as is done in incandescent lamp projectors, it was considered essential that the RCA Porto-Arc Projector incorporate an automatic film-speed operated fire shutter to protect the film in the event of accidental film stoppage.

'Latched' and 'Unlatched' Steps

By careful mechanical design, it proved possible to combine this function with that of a hand-operated "dowser" for keeping the light off the screen until the start of picture action. A centrifugal clutch was added to the regular picture shutter hub, and this clutch, via suitable linkage details, lifts an auxiliary shutter or "dowser" blade whenever the mechanism film speed exceeds 14 frames per second, and provided the manual control lever for it is unlatched. This lever is visible in Fig. 5 just to the left of the framer control and may be identified by its horizontal knob.

A simple notch in the lower edge of the lever provides the latched-shut feature. Slightly lifting the knob and pulling outward on it opens the dowser/fire shutter, but it will not stay open unless the mechanism film speed exceeds 14 frames per second as noted. Below this speed gravity forces in the linkage pull the blade closed, and it stays closed until the control lever is again manually lifted to unlatch it.

The housing for the 3450-rpm centrifugal blower normally associated with the projector mechanism's drive motor has been modified to provide strong cooling air blasts for the condenser lens, heat filter and picture aperture.

'Hard' Arclamp Details

Figure 6 shows the arc lamp with the operating-side door open and with the cover for the feed-ratio pulleys removed. The relatively small, compact housing design is made possible by the selection of a combination reflector-condenser optical system. In the Porto-Arc Projector the length of the lamp has been further reduced by mounting the condenser lens in the projector-mechanism housing.

The lamp is designed to operate with either the standard 30-amp., 28-volt Pearlex carbon trim, or with a new 10

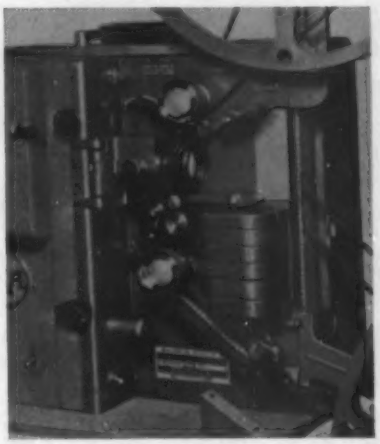
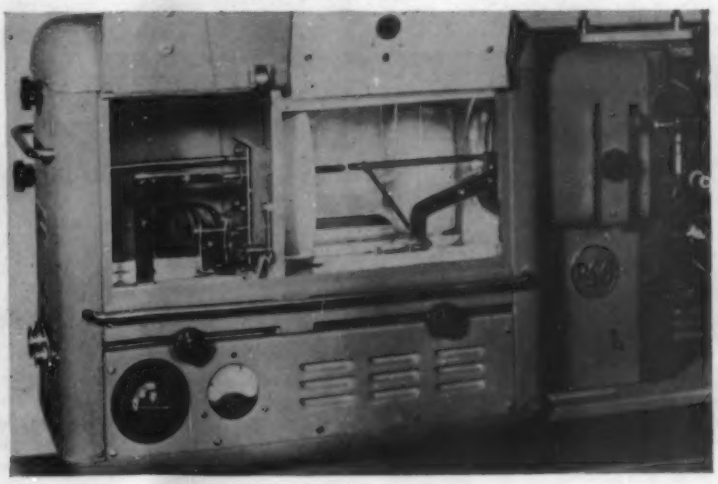


FIG. 5. The 16-mm projector mechanism.

amp., 50-volt trim. The 30-amp. trim, without heat filter in place and with the optical system adjusted for 70 percent side-to-center distribution, delivers 1600 lumens, using the two-blade 80-degree shutter normally supplied, and

(Continued on page 24)

FIG. 6. The carbon-arc lamphouse of the Porto-Arc.



IN THE SPOTLIGHT

NO sooner had the impassioned pleas of high-ranking motion picture executives (in this case, Adolph Zukor and Y. Frank Freeman) died away in the chill air of exhibitor reluctance when the sponsors of various crackpot single-film 3-D systems blatantly announced that their processes would "reduce projection manpower."

It is apparent that the motion picture exhibition field will not hesitate to pay for expensive projection equipment, but will not protect its investment therein to the extent of supplying adequate manpower to efficiently operate and maintain that equipment.

It becomes increasingly obvious that the mouthings of the so-called leaders of this industry are but mere catcalls in the economic jungle. At first terrified by the new technological processes, then a mite reassured by ascending box-offices grosses, these "great minds" reassumed their time-honored arrogance.

The investment that the exhibition field has made in new equipment within the past two years is just so much water over the dam if that investment be not protected by adequate operating and maintenance manpower. One may not "mothball" an apparatus that is designed to show a product intended to attract an hour-after-hour paying clientele. There is nothing static about the grim necessity for the ring of silver upon the box-office till—and nothing that the mealy-mouthed advocates of manpower "economy" may spout will ever serve to alter this basic fact.

Three charter members of Local 203, Easton, Penna., receive honorary life membership awards. Shown here, left to right: Harry Abbott, IA 3rd vice-president, who made the presentations; charter members Harry McIlroy, Edward M. Black, and James Dowling.

• Local 203, Easton, Penna., celebrated its 43rd anniversary last month at a banquet held at the Easton Moose Home. The membership turned out en masse to celebrate the event which was highlighted by the presentation of silver honorary life membership cards to the three remaining charter members: James Dowling, chief projectionist at the State Theatre; Edward M. Black, projectionist at the Embassy Theatre, and Harry McIlroy, assistant carpenter at the State Theatre. These men held membership in the Local when it received an IA charter back in 1911.

Kenneth S. Mack, president of the Local, presented copies of a scrapbook depicting the history of the theatre in

In recognition of many years of loyal and untiring services to Toronto Local 173, Jim Sturgess (center), president of the Local, is presented with a beautiful silver tea set. Pictured here at the presentation ceremonies are, left to right: Roy O'Connor, executive board member; Lorne Clarke, presentation committee member; Lou Lodge, secretary-treasurer; Gus Demery, chairman, presentation committee; Pat Travers, business representative; Sturgess, Art Kerrin, vice-president; Lou Applebaum, Dave Siegel, Roy Wilson, executive board members, and Bert Higgins, recording-secretary.

Members and guests of Local 332, Clinton, Iowa, as they gathered around the festive board in honor of the Local's recent 40th anniversary celebration. Pictured here, seated left to right, are Local members: A. E. Hubbard, secretary; James Wosoba, Andy Rutzbach, Clyde Baker, Charles Novotny, H. C. Andrews, president; Wm. Donnelly, IA 7th vice-president; Don Allison, mayor of Clinton; Paul Nedelhoffer, business representative; Charles Snyder, Bob Muhs, and Wm. Holdbrook. Managers of all the local theatres and many civic leaders were among the invited guests.

the Easton area to the award recipients and to Harry Abbott, IA 3rd vice-president, who made the presentations.

• Charles H. Travis, charter member, was presented with a life membership card in Local 314, Schenectady, N. Y. Travis has projected pictures for the past 46 years. In June 1953 he retired as projectionist at the Plaza Theatre, a position he held for 21 years.

• The many friends of Lawrence J. Katz, president of Local 488, Harrisburg, Penna., and IA representative, will be glad to learn that he is recovering from a serious indisposition suffered several weeks ago.

• IA Locals throughout the country contributed a total of $21,750 to the Will Rogers Memorial Hospital at Saranac Lake, as a result of the IA's 1953 Christmas Salute drive. This tops the previous year's contribution by $4,000.

• The stiff opposition of Chicago Projectionists Local 110 to the showing of the controversial motion picture film, "Salt of the Earth," has resulted in the cancellation of several widely-advertised bookings of this film in Chicago theatres. This feature, an independent production, has been blasted by IA Locals and American Legion posts throughout the country.

• A retirement fund, created jointly by Milwaukee Projectionists' Local 164 and the theatre exhibitors in its jurisdiction, has been announced by Oscar E. Olsen, the Local's business representative. This trust, which is financed by exhibitors paying a percentage of the projectionists' salaries into the fund, is administered by a six-man board of directors, three representing the exhibitors and three the Local. Harold J. Fitzgerald, president of Fox Wisconsin Amusement Corp., and Oscar E. Olsen are the co-chairmen. Glenn C. Kalkhoff and Robert O. Lucht are the other two union members serving on the board.

Under this trust fund a pension of $100 per month is paid to each member of the Local retiring at 65 years of age or older, and benefits are paid to members who are permanently disabled through illness or by accident.

At its first session, last January, the board retired eight members of the Local with pensions of $100 a month for life. These men, ranging in age from 67 to 76, are William Bodenstein, Hollie Fulmer, Alfred Bauman, George Mace, Arthur Westphal, Joseph Sasse, Jr., Jerome Washicheck, and Fred Lower. In addition, three other members—John Black, Herman Trampe, and Paul Bruder—were placed on the permanent disability list with payments of $100 per month.

Members of Local 676, Hornell, N. Y., at the Local's recent 25th anniversary celebration. Shown in the front row, left to right: Elliott Hazen, business representative; William Switzer, secretary, and George Griffing, president. Back row, left to right: Archie Tutton, Anthony Galeazzo, William Jackson, Jack Whitman, and Lynn Blackmer.

• The 25th anniversary celebration of Local 676, Hornell, N. Y., took place last month in the ballroom of the Moose Club in Hornell at the close of the annual Spring meeting of the N. Y. State Association of Motion Picture Projectionists. Delegates and guests of the Association were invited to the celebration, which was attended by prominent civic and top IA personnel. Sound movies of the Association's 1953 Fall meeting were shown, wherein President Tuttle stole the acting honors.

One of the features of the party was the presentation to the popular secretary of the 25-30 Club of New York City, Morris Klapholz, and his wife of a beautiful cake in honor of their 39th wedding anniversary. This very gracious gesture on the part of the Hornell Local is one that we are sure the Klapholz' will long remember and cherish.

• *Visitors from Out-of-Town:* James J. Gebhart, member of Local 515, Shamokin, Penn., and Mrs. Gebhart visited with the IP staff during their recent visit to this city. As a sideline, the Gebharts are expert locksmiths and had many an amusing story to tell of their experiences in this field.

From Toronto, Canada, came "Pat" Travers, the popular business repre-

Manuel Ayala and Alfred Pena, members of San Antonio Local 407, attended the Mexican STIC convention at Tampico, Mexico, as delegates from their Local. The Mexican union is equivalent to our IATSE. The white arrow points to Ayala.

sentative for Local 173, and B. Crowe, charter member of the Local. Harry Sherman, the late conductor of these columns, had a very warm spot in his heart for the Toronto boys and this regard has been passed on to the writer. We enjoyed these visits and look forward to more of them.

• The Iowa State Association held its 24th meeting on May 11 at the Blackhawk Hotel in Davenport, Iowa. Among the many topics discussed at the meeting was a pension and retirement plan designed primarily for labor unions. This plan was briefly outlined by Mr. Leo Frenzl, a specialist in such matters, who stated that IA President Walsh and General Secretary-Treasurer Holdmen showed much interest in the plan when he presented it to them.

William Donnelly, IA 7th vice-president and business representative for Minneapolis Local 13, addressed the gathering and urged that all Locals lend their support to the LLPE (Labor's League for Political Education). He stressed the importance of this organization in Labor's fight against unfriendly lawmakers.

Many of the delegates present reported that their Locals receive extra pay for preparatory time when showing pictures in the new processes. A number of them stated that their Locals get preparatory time regardless of the medium in which pictures are shown.

When the meeting adjourned, the delegates were the guests of Davenport Locals 85 and 433 at a midnight banquet held at the Labor Temple.

• Among the many interesting topics discussed at the recent semi-annual meeting of the N. Y. State Association of Motion Picture Projectionists was the all-important matter of welfare and pension plans. It became apparent that such plans vary widely among various Local Unions in a given state, such ramifications affecting adversely the security of the worker.

For example, Morris Klapholz, representing the 25-30 Club of New York City, told how the RKO and Loew's circuits eliminated their own welfare plan when the Local 306 pension plan became effective. It was emphasized that there now exists many so-called welfare plans which involve the contribution over a period of years by a worker who, upon being taken ill and forced to leave his theatre post, is unable to continue his welfare plan payments and thereby forefits any interest in and right to his accumulated payments.

Pension Collection Ratio

Another point of especial significance was developed during the discussions, namely, that statistics prove that only one out of ten men may expect to benefit from the various pension plans now in effect, and then for only a limited period of three years.

It would seem to be the part of wisdom for the most comprehensive and intensive exchange of information anent such welfare and pension plans among the various units of a given craft. Insurance companies specializing in this form of underwriting have amassed a great wealth of data thereon which they will be only too glad to make available to any interested parties.

Dr. Leon W. Wells (center) who developed the Pola-Lite 3-D system, explains the details of the single-track 3-D projection attachment to Wilfred Dawson, left, and William Esperti, right, members of Detroit Local 199 and projectionists at the Roxy Theatre in Detroit, where this unit had its premiere showing.

• The AF of L and CIO Peace Committees met in Washington, D. C. on June 9 and signed no-raiding pacts. AF of L President George Meany and CIO President Walter P. Reuther attended the meeting. This is said to be the first step in the long drawn out negotiations to bring about a merger between these two labor organizations.

Shown in attendance at the recent Iowa State Association meeting which was held in Davenport, Iowa. Back row, left to right: Ray Jiruska, L. 191, Cedar Rapids; Richard Murphy, L. 85, Davenport; Paul Nadelhoffer, L. 332, Clinton; Fred Parker, L. 433, Davenport; next six unknown; Theodore Garretson, L. 433, and Bruce Watson, L. 238, Muscatine. Middle row: J. R. Marksbury, L. 355, Sioux City; A. E. Hubbard, L. 332; Harold Weigand, L. 450, Mason City, and Edward DeBorde, L. 67, Des Moines. Seated, front row: James Seese, L. 202, Waterloo; Clyde Cooley, L. 343, Omaha; George Brayfield, IA trustee; Wm. Donnelly, 7th IA vice-president; Robert Olson, L. 509, Duluth, Minn. (president of Minnesota State Federation of Labor); Louis Lannon, L. 103, Dubuque; George Stoddard, L. 433, and Burt Martin, L. 40 and 355, Mason City. Gordon E. Beck, president of the Association, is shown in front center.

IA OBITUARIES

FLOYD WOODSMALL, 42, member of Local 164, Milwaukee, Wis. since 1937, died suddenly last month at his newly completed home at Nagawicka Lake, to which he recently moved his family. He was employed as projectionist at the Fox-Princess Theatre in downtown Milwaukee. He is survived by his wife, two daughters and a sister and a brother.

J. A. BAINBRIDGE, one of the oldest members of San Francisco Local 162, died early this month. Although he retired some years ago from all activities, he maintained his interest in Local 162 affairs. During the early years of his career, "Bainy," as he was affectionately known to all his friends, was in the theatre supply business, in charge of the S. F. agency for the Powers projectors.

WALDON MCDONALD, member of St. Louis Local 143, succumbed to fatal injuries sustained in an automobile accident last month. In addition to working as projectionist he operated a theatrical agency.

LETTERS TO THE EDITOR

Splicing CinemaScope Prints

To the Editor of IP:

I hear and read complaints that CinemaScope film is difficult to splice. I have also heard it suggested that the best way to insure good splices on CinemaScope film is to bring a "hot" splicer into the projection room.

I believe that the proper approach to splicing CinemaScope film is only slightly different from methods used all along. The fact that the sprocket-hole dimensions of CinemaScope film are smaller than standard, and that the magnetic-sound striping is on the opposite side of the film base from the emulsion, are the only two factors that make splicing different. At Loew's we solved this problem by purchasing the recently-marketed Neuscope splicer (Neumade Products) which is designed especially for CinemaScope.

In my opinion, there is no more reason for using a "hot" splicer on CinemaScope than on any other film. In addition, with all the extra equipment that the projectionist has been required to handle during the past year, it is confusing and unfair to suggest that additional equipment in the form of a "hot" splicer is also needed.

One-Operation Procedure

The advantage of the Neuscope splicer is that once the film is positioned in the splicer, it is not removed until the splice is completed. If a standard bench splicer is used, it would be necessary to remove both ends of the CinemaScope film from the splicer during the process so that both edges could be scraped and the magnetic striping be removed from the splice area as well as the emulsion. Also, the register pins of the Neuscope splicer are made to fit CinemaScope sprocket dimensions.

The film is placed in the Neuscope splicer in the same way as formerly with the Griswold bench splicer. Using the wire-brush and scraper unit available with the splicer, scrape the left-hand film section. Then swing the right-hand jaw to wide-open position and remove the magnetic tracks from the base side of the right-hand film section with the wire brush, roughening the base at the same time.

Apply any good commercial cement, and clamp the splice, allowing a setting time of approximately 20 seconds. Open the splicer and remove the film. Result —a perfect patch.

All this is done with the aid of a simple bench splicer designed especially for CinemaScope film and without the aid of a "hot" splicer. Although it may have value in the film laboratory or in the exchange, I feel that a "hot" splicer is out of place in the modern projection room.

M. D. O'BRIEN
Director, Sound & Visual Projection,
Loew's, Inc.

Good Lens Tissue Available

To the Editor of IP:

We agree in the main with the comments made by Robert A. Mitchell in the article "The Lens: Key to Projection Quality," which appeared in your April issue. The suggestions made therein provide an excellent basis for proper procedure in the care and maintenance of the high-quality lenses we now use, and, moreover, emphasize the "don'ts" which, if employed, would impair lens performance.

However, we think that on page 33 of the aforementioned article the several paragraphs devoted to cleaning lens surfaces should be clarified: the phrase "do not use 'lens paper,'" should definitely not be construed to mean that there is *not* an effective lens *tissue* available. We have long supplied a lens tissue to the industry which has received the approval of all the major film research laboratories.

The cleaning of a good lens is a matter of paramount importance in the projection field, hence we think it inaccurate to leave with your readers the impression that there does not exist a *wholly acceptable* lens-cleaning tissue and lens-cleaning fluid. Yours for better projection.

S. K. ROSENSTEIN
Rosco Laboratories, 367 Hudson Ave.,
Brooklyn, N. Y.

Ratios, Balcony, Curved Screen

To the Editor of IP:

For the most part I concur with your article in the April issue of IP. However, I like the 2.55 to 1 ratio of Fox. It is nearer the natural field of vision than that of any other reproduction system. Also, do not overlook a competitive comparison. The old 3 x 4 ratio, or even 2 to 1, permits too close association in the viewer's mind with Tv.

Like any other new device or tool, the industry must learn to use it to best advantage. CinemaScope should be installed with screens from wall to wall. It is most important not to distract the viewer's attention with organ lofts, auditorium ornamentation or other adornments of no particular value in a movie theatre. The balcony is as outmoded as the Model "T". It is both an economic and technical liability.

Of course the screen should be flat. Cut through the fog of optical misinformation, and it is quite simple. A projection lens magnifies a flat image obtained from a flat film. Perhaps more harm has been done to the industry by the giant curved screen than any other crackpot idea ever offered.

DONALD E. BALL
809 Division St., Clarks Summit, Pa.

Accolade From the Antipodes

To the Editor of IP:

Each month this Union receives regularly three copies of INTERNATIONAL PROJECTIONIST. These I distribute to local projectionists and other members of this Union. After their return, copies are filed for reference. The contents of your magazine are always of interest, especially to projectionists in this part of the world who find the technical articles of great help to them.

R. KIRK,
Honorary Secretary
Otago and Southland Projectionists' Union, Dunedin, C.I., New Zealand.

Wire Brush Not Needed

To the Editor of IP:

When reading the "What's Your Problem?" column in the March issue of IP, I noticed that the writer practically demanded that a wire brush be standard projection room equipment for splicing CinemaScope film. I find, after running seven different CinemaScope pictures, that the brush is not necessary. If you place the film in the splicer with the sound tracks up and apply a little film cement to the sound tracks to soften them up, the regular emulsion scraper supplied with the splicer can remove the magnetic striping with ease. Try it. It works!

HAROLD L. WEIGAND
Mason City, Iowa

[EDITOR'S NOTE: It would appear that Mr. Weigand is talking about splicing CinemaScope Film with a *standard* splicer. The information in IP about the wire brush referred to its use in connection with the new Griswold splicer designed especially for CinemaScope. The pressure clamp assembly on this splicer requires use of the brush if best results are to be obtained.]

From Muybridge To CinemaScope

By JAMES CARD
Curator, George Eastman House

AN EPOCH started on May 4, 1880. Edweard Muybridge projected on a screen his moving picture studies of animal locomotion. Spectators were members of the San Francisco Art Association and gentlemen of the press. One reviewer reporting his show the next day in the *San Francisco Alta* wrote: "Mr. Muybridge has laid the foundation of a new method of entertaining the people."

From that 1880 date until the end of the century, motion picture inventions crowded the files of patent offices around the world. The activity reached a peak in 1896. In 1895 the first film fans in France, Germany, Switzerland, Great Britain and the United States were responding to their earliest chance to buy entertainment furnished by motion pictures.

In five years' time there was already too much from which showmen could choose. By 1900 there were available sound films, trick films with stop-motion effects and multiple exposures, news features, story films and movies in color. Fifty-four years ago, they even had Cineorama and the wide-screen (69 feet wide, by the way).

The Paris Exposition

All this was displayed in dazzling profusion at the great Paris Exposition celebrating the advent of the Twentieth Century. It was there that the voices of Sarah Bernhardt and Coquelin spoke from motion picture screens. It was there that Cineorama, the patented invention of Raoul Grimoin-Sanson, made its debut.

Today's version, the Cinerama is less than half of what the 1900 spectacle was. Instead of just three synchronized cameras and projectors, Sanson used ten. Instead of a screen 25 feet high, the French inventor used a screen 30 feet in height that completely surrounded the spectators. In 1900 the watchers stood right in the middle of a gigantic moving picture, projected in color from ten synchronized movie machines, merging ten separate films into a single vast, encompassing scene.

At the same exposition there was a wide-screen presentation that would have impressed today's most ardent champions of CinemaScope: the brothers Lumiere showed their films in color, on a gigantic screen 48 by 69 feet and seated 25,000 viewers at a single session.

Flood of Inventions

Invention had come too fast. The movies were too rich in ideas. The flood of brilliant devices given to the world by 1900 could not be absorbed commercially in a field so new. In a few years, for practical purposes, the movies were stripped to the essential novelty: images in movement.

The bones of nearly everything basic to the medium today were then stored away in the closets of the movies' past—skeletons of the wondrous systems destined to delight beholders in the new century.

Sound — dialogue — color — and 3-D each remained for the most part hidden in the past, each awaiting its cue for the proper time to be brought out and appended once again to the moving image that is the heart of the cinema.

Each time, it was to meet a crisis that one of these old treasures was brought out of the shadows of the nineteenth century and dramatically presented anew to the jaded public eye.

Radio Competition

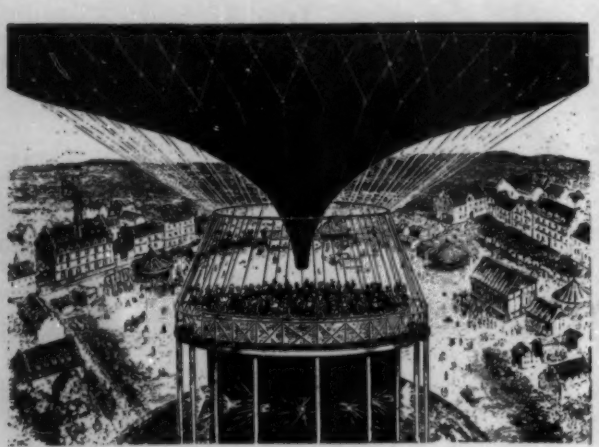
Back in 1926, radio provided the crisis. From the time of Edison's first film experiments, there had been attempts at talking pictures. By 1912, Gaumont was producing elaborate dialogue films with sound effects and musical accompaniment. Sound-on-film had been developed as early as 1908. But the time was not at hand to catch the public ear. From 1912 to 1926 the film held its tongue. The movies kept their silence until the radio forced them to speak up.

Muybridge photographs like these, produced by multiple cameras operated by strings attached to electric switches which controlled the shutters, proved that a horse in a gallop lifts all four feet off the ground at once. These photos, made to settle a bet, are a milestone in motion picture history.

The silent film was threatened by the new device. Thousands of head-phoned Americans were staying home to carefully guide cat's-whiskers to the highest spot on the crystals of bed-side radio sets. Then came the loudspeakers and the whole family seemed in danger of preferring the static from KDKA to the mute allure of Hollywood's most sparkling shadow stars. The movies met this audio challenge in 1926 with Vitaphone and movietone.

Now a new challenge has been hurled at the cinema. This time the attack came from television in an area where the movies seemed most secure — in the field of sight rather than sound. The film men have countered with visual displays of stereo effects and larger screen sizes, all devices a half-century old.

The movies still have all manner of surprising devices stored undeveloped in their past that await only contemporary vision and energy to adapt them to present usefulness. We are still living in the age of vision.



The Cinerama of Raoul Grimon-Sanson was featured at the Paris Exposition of 1900. Ten synchronized projectors gave a 360 degree picture. The spectators stood in the middle of this huge moving picture.

Governor Leland Stanford of California made the bet; Muybridge tackled the tough photographic job. After many trials, the latter lined up a number of cameras along

a track. Eventually he attached strings to electric switches that controlled the camera shutters. When a horse galloped past, it broke the strings one after another. The shutters were released and negatives made in a series. The photographs proved that Governor Stanford was right. The feet were off the ground during the gallop.

Filled Still-Motion Picture Gap

Muybridge was a pioneer in instantaneous photography. His work fills the gap between still and motion picture history. While he set out to eliminate motion by stopping it in pictures, in 1880 he also projected photos intermittently. This produced motion on the screen, thus anticipating motion picture.

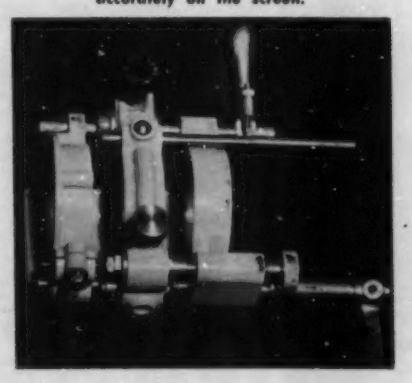
His projected pictures of horses in motion amazed audiences. *The San Francisco Call* of May 5, 1880, reported that "nothing was wanting but the clatter of the hoofs upon the turf and an occasional breath of steam from the nostrils, to make the spectator believe that he had before him genuine flesh-and-blood steeds."

Battery of 24 Cameras

Later Muybridge went to Philadelphia where he continued his work at the University of Pennsylvania from 1883 to 1885. Here he perfected his equipment. He also turned to use of the new dry plates for shorter exposures. The results of his work were published in a series of 781 illustrations on animal locomotion. For his pictures he used horses and animals of all kinds from the Philadelphia Zoo as well as human models.

Muybridge's photography at Philadelphia was done outdoors against a black background. Opposite the background he had a battery of 24 cameras. A camera in the collection at Eastman House is one of these. Also in the collection are Muybridge's notebooks, 13 albums containing a large number of his duplicate negatives, and an album of albumen prints which are considered to be the best of his work.

A Universal lens mount designed to permit quick switching from CinemaScope to standard 3 by 4 projection during a show is shown below. Designed and produced by Dave Corbett, of Projection Products, N.Y.C., the device makes possible vertical and horizontal adjustments of the projection lens to compensate for the slightly different position of the CinemaScope and standard apertures in relation to the projector optical train. Without this correction, neither picture will be centered accurately on the screen.



The Marauders Mutter

The "accompanying literature" mentioned in the appended communication could hardly be news to IP readers for the reason that Mr. Mitchell has in his contributions to IP been both meticulous and far-ranging in his comments on projection technological developments.

In Anguished Tones

VEB ZEISS IKON DRESDEN

International Projectionist
Publishing Co., Inc.
19 West 44th Street,
New York 36, N.Y.

Ihr Zeichen — Ihre Nachricht vom — Unser Zeichen — Unsere Nachricht vom — Name — Datum
TEP 21a/Mtm/1562 1997 23.2.1954

"International Projectionist", Nr. 12/1953, Seite 7.

In Heft 12/53 Ihrer Zeitschrift "International Projectionist" veröffentlichten Sie einen Artikel von Herrn Robert A. Mitchell unter dem Titel:

"Recent Projection Advances in Europe".

Den Ausführungen dieses Artikels über die kinotechnische Entwicklung im Gebiete der DDR (Ostdeutschland) müssen wir entnehmen, dass Herrn Mitchell unsere Neuentwicklungen an Theatermaschinen nicht bekannt sind.

Wir erlauben uns deshalb, Ihnen Prospektmaterial über die von uns hergestellten Theatermaschinen vom Typ D 1 und D 2 zur Verfügung zu stellen. Beim Studium dieser Prospekte werden Sie feststellen, dass es sich bei diesen Maschinen gegenüber der Ihnen bekannten Ernemann VII B um grundsätzliche Neukonstruktionen handelt, die eine Reihe von wesentlichen Neuheiten aufweisen.

Wir würden es begrüssen, wenn Herr Mitchell als international bekannter Kinofachmann den Leserkreis der "International Projectionist" von diesen beiden neuen Maschinen Kenntnis gibt und bitten Sie, ihm unser Schreiben und das beigefügte Prospektmaterial zur Verfügung zu stellen.

Anlagen.
D 1 - Bilderliste
D 1 - Betriebsvorschrift

Hochachtungsvoll
VEB ZEISS IKON
(Metz) (Weichelt)

Translation:

IN THE 12/53 number of your periodical, "International Projectionist," you published an article by Mr. Robert A. Mitchell under the title:

"Recent Projection Advances in Europe"

The absence of material in this article on motion-picture technological progress in the People's Democratic Republic of Germany (East Germany) forces us to the conclusion that Mr. Mitchell is unacquainted with our new developments in theatre machines.

We take this opportunity, therefore, to place at your disposal descriptive material on the Type D1 and D2 theatre machines manufactured by us. On studying these bulletins you will have to admit that these projectors, in comparison with the Ernemann VII-B with which you are already familiar, reveal a basically new construction and quite a number of substantially new features.

We should appreciate it very much if Mr. Mitchell, as an internationally-known motion-picture technologist, would acquaint the readers of "International Projectionist" with both of these new projectors, and we also ask that you send him our communication and the accompanying literature.

Yours very truly,
VEB ZEISS IKON, DRESDEN, GERMANY

Mitchell Comment:

EXAMINATION of the literature on the *D-1* and *D-2* projectors reveals a radical rearrangement of Ernemann-type projector parts, the whole enclosed in an *unorthodox* housing. I do not, personally, care for this type of enclosure or for the square, and rather primitive, construction of the lamphouse.

The lower part of the mechanism itself, containing the sound reproducer, seems rather cramped, though mechanically good design. Having no information on the quality of the materials and workmanship in these two projectors, I can offer no comment on their performance. On the whole, these projectors, while possibly noteworthy, do not seem to incorporate significant features of really new conception — apart from the housing and arrangement of the controls.

Quick Projector Reversal

According to measurements just completed by the Eastman Kodak Co., it takes less than one second to achieve a complete reversal from forward sound speed to reverse sound speed with the Kodak Analyst projector. The Analyst, designed for use by athletic coaches and others who want to be able to rapidly reverse projection for motion study purposes, is equipped with a hand-held, push-button, reversing switch for maximum ease in projection control.

NEW RCA PORTABLE 16-MM 'PORTOARC' PROJECTOR

(Continued from page 17)

an F/1.6 lens. The 10-amp. trim under the same conditions delivers 850 lumens which is in the order of twice the available from ordinary incandescent-lamp 16-mm projectors.

Burning Times, Controls

One 30-amp. trim lasts 56 minutes, which accommodates a 2000-foot reel at 16-mm sound speed. By contrast, the 10-amp. trim burns 2 hours 15 minutes, which accommodates 4000-foot reels, though special feed and take-up facilities, which are being designed, are required.

In Fig. 6 the outer edge of the elliptical reflector or mirror shows approximately in line with the left edge of the heat shield on the opened door. It is 7½ inches in diameter and is mounted on a vertical baffle within the arc lamp by a three-point, spring-seated suspension. The center of the mirror is over 3 inches behind the arc to reduce fogging tendencies from arc gases.

Two control knobs extending to the back of the arc lamp from the reflector's spring-mounted support frame provide tilt and training adjustments for uniform illumination of the projector-mechanism aperture. The working distance of the mirror alone is 25 inches but for the combination of mirror and condenser the working distance is less than 17 inches. The optical speed of the combination is approximately F/1.6, which matches well with the speed of the fastest projection lenses customarily used.

Condenser Arrangement

The condenser lens is situated about 13 inches from the mirror and is made of heat-resistant glass. It not only performs the optical function noted, but also effectively serves as a barrier to prevent cooling air currents from disturbing the arc. The condenser lens is mounted in a pull-out carriage visible in Fig. 6 just above the RCA monogram.

Other items of interest visible in Fig. 6 are the positive-carbon holder and carbon-tip guide, which are designed to obstruct the minimum possible light from the reflector. To the rear of the mirror supporting baffle is the negative-carbon holder, and just below it may be seen the mercury interlock switch actuated by the lamp door.

Double Feed Screws

When the lamp is in operation the two carbon holders are moved slowly toward each other within the lamp base by their supporting carriages, which ride on two longitudinal feed screws. The carriages may be manually positioned along the screws for arc trimming and striking by means of the control knobs operating in the slots just below the door opening. Stops for the carriages cause the feeding action to cease when carbons burn down to stubs 2 inches long, thus preventing accidental damage to holders and tip guides.

The ends of the feed screws protrude through the rear of the lamp housing as shown and support double-groove spring-belt pulleys. Moving the belt from one set of grooves to the other changes the negative/positive feed ratios to suit the relative burning rates of the two different carbon trims for which the lamp is designed.

The feed screws are driven by a specially wound D.C. series motor connected to the arc circuit via an arc-current operated relay so that feeding action does not begin until the arc is struck. This effectively prevents accidental freezing of the carbons if power is inadvertently left on without striking the arc. The series motor circuit includes the average feed-rate control rheostat shown just to the left of the arc-current ammeter.

Arc Stabilization

In addition to the normal series motor-type field windings, the feed motor carries an additional field winding through which the arc current passes. The combined forces of the resultant fields provide a very effective stabilization action for the burning arc; for example, if the arc current tends to rise, say because the line voltage has gone up a few volts, the feed motor slows down so the arc gap lengthens slightly to bring the current back to the former value. The reverse action occurs if the current tends to fall.

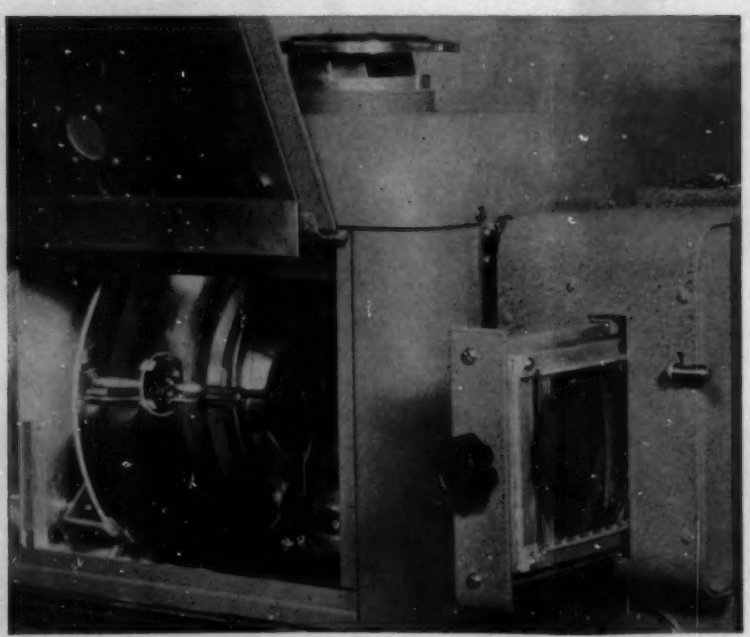
Figure 7 is another close-up of the arc lamp with the condenser carriage pulled out to show the heat filter. Also visible in this view is the rigid-tip guide for the negative carbon. The filter-glass strips are carried in an auxiliary holder which is easily slipped in or out of mating guides on the condenser carriage as shown.

Experience to date has shown that with the degree of aperture cooling provided it is possible to run nearly all color films safely at 30-amp. operation without the heat filter because they are relatively transparent to the longer-wavelength radiant energy. The heat filter is usually required for black-and-white films unless they happen to be of rather low density. The filter is essential for all types of film when operating at the projector's 16 frames per second film speed, but is not usually required for sound-speed 10-amp. lamp operation.

Ventilation System

At the top of the lamp in Fig. 7 the ventilation chimney shows. It incorporates a scoop-shaped inner section, extending downward just above the arc to the edge of the light beam, which

FIG. 7. The projector's heat filter, a unique feature of Porto-Arc design.



serves as a collector for the carbon electrode combustion products produced by the burning arc. The chimney assembly pulls out for cleaning; the dust washes off easily in cold running water.

Two openings are visible in the heat shield on the inner surface of the opened lamp door in Fig. 7. The larger opening is provided with heat-resistant dark glass for observation of the burning arc. The smaller opening is the port through which light from the arc enters the mirror assembly of the lamp's "arcoscope" on the outer door surface. Referring to Fig. 2, which shows the door closed, the mirror assembly is seen just above the observation port, and it throws images of the brilliant carbon tips to the white screen directly below it.

Arc-to-Mirror Adjustment

During initial testing of the lamp and projector mechanism the position of the burning arc with respect to the mirror is manually adjusted for maximum light output consistent with approximately 70 percent side-to-center light distribution on the screen. Lines are then scribed on the arcoscope screen marking the corresponding carbon-tip positions, and these lines become the references for subsequent lamp operation. As a rule, mirror characteristics are within tolerances which permit mirror replacement without scribing new reference lines.

Figure 2 also shows the 30-amp. rectifier in place under the pedestal-amplifier. The 10-amp. rectifier is identical in exterior appearance. These rectifiers are used to convert alternating current from the power line to direct current required for proper operation of the arc. The 30-amp. rectifier uses two standard 15-amp. gas rectifier tubes; the 10-amp. rectifier uses two 6-amp. tubes. Both rectifiers are provided with primary tap switches to accommodate varying line voltage and load conditions.

Box-Office Tv Appeal to FCC

Skiatron Tv Corp. will file a petition with the FCC for Federal approval of the various systems of collecting a fee from viewers of special Tv programs. Zenith Radio Corp. has already filed on behalf of its PhoneVision system. The Skiatron system requires no connection with telephone or other outside carrier lines, but functions by means of a coded card which "unscrambles" the special Tv program when the card is inserted in an apparatus attached to the Tv set.

Another box-office Tv system is Telemeter which, half-owned by Paramount, works by means of an electronic coin box attached to the set. It is now being tested on the West Coast.

Super Snaplites are better indoors or out. Sharper Pictures, Greater Contrast, More Light, Better Definition all add up to happy patrons. Make your Movies Better Than Ever; use Super Snaplite lenses. Super Snaplite Projection Lenses give a true speed for f/1.9 in every focal length up to 7 inches. Ask for Bulletins 207 and 209.

Also Series II SNAPLITES with a speed of f/2.0

KOLLMORGEN Optical CORPORATION

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The Xenon Gas Lamp for 16-mm Projection

The Xenon lamp, a small quartz envelope lamp developed originally for searchlight work, has lately been found adaptable for use in 16-mm projection. At the moment of merely academic interest to professional projectionists, this lamp is a fruitful source for speculation, since it is much brighter than the usual tungsten light source.

A descriptive paper on the Xenon lamp was read at the Spring convention of the SMPTE in Washington, D. C., where a comparative test was made of the screen images from two projectors, one equipped with a Xenon arc or gas lamp and the other with a standard tungsten lamp. The Xenon lamp was said to provide 2000 lumens of light to the screen compared with 500 from the tungsten source.

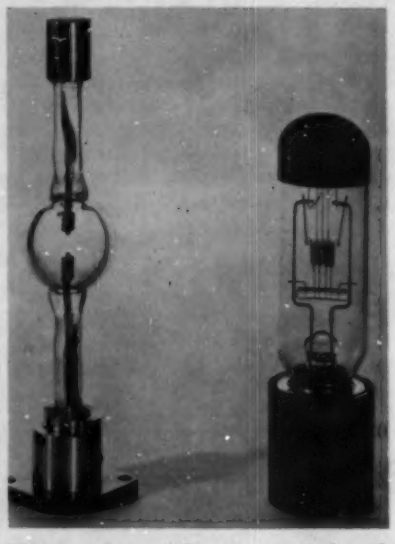
Because 16-mm projection will, in all likelihood, continue to use a tungsten light source primarily, the basic problem in developing a light source with a much higher output was to closely approximate the characteristics of the Mazda lamp for which 16-mm prints are balanced.

Emits Bluish Light

While the Xenon arc stream inside the quartz envelop is of much higher color temperature than Mazda light source and the blues are somewhat accentuated in the projected picture, the increased light output plus the balancing presence of red is considered to more than compensate for the difference in color temperature in many applications.

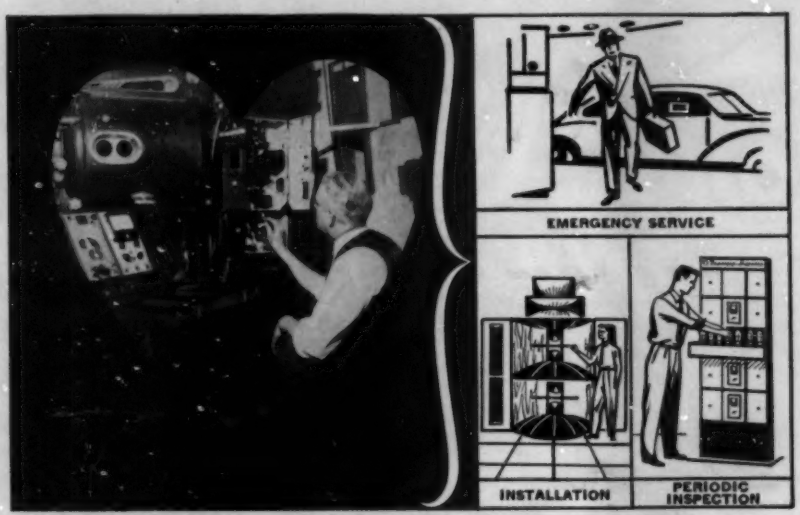
An interesting feature of the Xenon lamp is that it has been designed to eliminate the shutter from projection. This is done in the following way:

When supplied with alternating current, the lamp ignites on each alteration or twice per cycle. When supplied by a 60-cycle source, 120 light pulses per second originate between the electrodes of the lamp. Therefore, since the 24 pictures per second speed, which is standard for sound film, is an even multiple of the 120 light pulses per second, the shutter can be eliminated if a special ballast circuit shapes the alternating current so that the film pulldown is accomplished when the lamp is dark.



Xenon gaslamp (left) as contrasted with standard tungsten lamp.

The paper on the Xenon arc presented at the SMPTE convention was read by E. W. D'Arcy, now with the Bell & Howell and formerly with DeVry, a company which has done development work on the Xenon lamp for motion picture projection.



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More than 25 years of knowledge and experience in the installation and maintenance of all kinds of theatre sound systems assures you top standards of performance in *Stereophonic Sound.*

In addition, thoroughly dependable, prompt and courteous service are yours when you call in RCA Theatre Service.

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A Radio Corporation of America Subsidiary
Camden, N. J.

JACKSON'S Reel-End Alarms
Automatic, not Electric! Projectionists' Favorite! Patented — truly Dependable!
$21.50 per pair
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Test one at your dealer or write to
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Magnetic Sound Recording; How It Was Developed

The discovery of magnetic sound recording and reproduction processes is by no means recent. Although it went into use in the projection room only a short time ago, magnetic reproduction was first introduced at approximately the same time that the motion picture itself was discovered.

The first magnetic recorder was shown to the world in 1898, just 10 years after George Eastman revolutionized photography with his development of the roll film and made the motion picture possible. It was at that time that a Danish scientist named Vlademar Poulsen developed a wire recorder that was designed primarily for dictation.

Steel Wire First Medium

This machine was both mechanically and electrically inefficient, but it effectively demonstrated the working principle of converting electrical energy into magnetic fields of varying intensity, impressing these magnetic fields upon a moving magnetizable medium, and later reconverting these recorded magnetic fields back into electrical energy.

Steel wire was the magnetizable medium in all early experiments with

What are the facts about

CANCER OF THE LUNG...?

JUST 20 YEARS AGO, in 1933, cancer of the lung killed 2,252 American men. Last year, it killed some 18,500.

WHY THIS STARTLING INCREASE? Our researchers are finding the answers as rapidly as funds and facilities permit—but there isn't enough money.

DOCTORS ESTIMATE that 50% of all men who develop lung cancer could be cured if treated in time. But we are actually saving only 5%...just one-tenth as many as we should.

WHY—? Many reasons. But one of the most important is not enough money... for mobile X-ray units, for diagnosis and treatment facilities, for training technicians and physicians.

THESE ARE JUST A FEW of the reasons why *you* should contribute generously to the American Cancer Society. Please do it now! *Your* donation is needed—and urgently needed—for the fight against cancer is *everybody's* fight.

Cancer
MAN'S CRUELEST ENEMY
Strike back—Give
AMERICAN CANCER SOCIETY

DRIVE-INS THROUGHOUT THE COUNTRY KNOW WHY...

It's Smart to do Business with

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magnetic recording. Although patents for coated tape, the medium that has now been adapted into a motion picture sound track, were granted in both the United States and in Germany in 1927, coated magnetic tape did not come into use for a long time afterward.

The German Broadcasting Co. used a steel tape machine in 1935 for mobile pickups. When American manufacturers began to manufacture magnetic recorders, they completely ignored the earlier patents on coated tape and concentrated on wire recorders.

It was only after World War II that it was discovered in this country that paper and plastic magnetic tape could be developed to such a high degree as to supercede all other forms of recording. Manufacturers then leaped on the bandwagon, and further development in the tape recording principle during the late forties resulted in the magnetic sound stripe, a thin stripe of magnetic tape which was applied to processed movie film for use as a sound track.

1953 saw the introduction of the CinemaScope sound system, four narrow magnetic sound tracks placed on one strip of film along with the picture. Now, more than 50 years after their invention, motion pictures and magnetic recording have been combined.

Navy Releases Electronics Course

A course in electricity and basic electronics, designed to present the essentials for advanced study or specialization, will shortly be published by John F. Rider, 480 Canal St., New York. The course, originally developed by the Navy for use in its schools, is regarded as being extremely simple and effective in its approach, and understandable to those without previous technological training.

NORPAT Selenium Rectifiers

A line of heavy-duty selenium rectifiers has been marketed by Norpat Sales, Inc., New York. M. D. Faige, Norpat president, states that "every major part of the rectifiers from the 50,000-hour selenium stack itself to the line transformers has been designed to meet and surpass NEMA specifications."

All models, large and small, have full glass insulated transformers. Ripple is held to 1%, and with 12-phase full-wave rectification, giving 720 impulses per second, results in a very low flicker, according to the manufacturer. By means of a 21-position, 8-point switch, wired to each phase of the 3-phase line transformer, output current and voltage are controlled to the arc.

Operating Safety Factors

In addition to a thermal switch, which shuts off the unit in the event of fan blower failure to prevent damage to the transformer and stacks, an audible signal device is provided to warn the operator of excess temperatures. This would enable him to install an auxiliary floor fan at once and prevent failure until there was time to check the cause.

Every unit is coated against corrosion and humidity effects. The equipment

GREATEST NEWS YET IN THEATRE SOUND!

PERSPECTA STEREOPHONIC SOUND

Multi-directional sound on a standard optical track

This is it! The simple, permanent sound system that solves all the exhibitor's stereophonic sound problems—and it's fully compatible with conventional sound systems. Projection procedures remain the same, too.

Exhibitors with stereophonic sound can switch to Perspecta Stereophonic Sound by installing only an integrator unit, design-engineered by Fairchild. Theatres equipped for conventional sound need only that single miracle unit plus additional power amplifiers, loudspeakers and a multiple gang fader.

REMEMBER! *MGM, Paramount and Warner Bros. are now filming all productions with this new technique.*

See your theatre supply dealer for full information or write:

FAIRCHILD RECORDING EQUIPMENT

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Film breaks are costly. Play safe by using

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Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

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For CINEMASCOPE

3-D, Drive-Ins, and other Wide Area Screens

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is designed for 50/60 cycle operation, and rectifier stacks are rated for 50% voltage overloads and for continuous duty at 25% current overloads. Completed equipment is tested for prolonged periods at 25% overload. Detailed test reports, approved by chief electrical and mechanical engineers, accompany each unit.

Projection Tv for Home

An improved projection-type Tv receiver is under development by the Skiatron Electronics and Television Corp. The projector, said to substitute an "ultrasonic" cell for the usual cathode or picture tube, is being designed to provide a picture 3 by 4 feet with a degree of brightness equal to that of a 16-mm home movie.

The company hopes that the projection portion of the set can be constructed with approximately the same proportions as a 16-mm projector. Sound equipment would vary in size and complexity, depending on what sort of reproduction is desired. The company is aiming at a selling price comparable to a 21-inch Tv set of the standard type.

British Technicians Protest

The British Association of Cinematograph Technicians will bring the "utmost pressure" on American companies producing films in England to turn out pictures "essentially British in character" and to employ British stars and technicians. The group also plans to press for a government-owned theatre circuit to compete with England's large private theatre chains.

Surface Wiring for Drive-ins

Magnasync Co., Hollywood, is completing tests on an inexpensive surface-wiring procedure for drive-ins that would involve a heat-and shock-resistant cable laid on the surface of a field and covered with asphalt.

National Theatres' Profit Dips

National Theatre Circuit has announced a decline in profits for the six-month period ending March 27, 1954. Consolidated net profit for the chain and voting-controlled subsidiaries during this period totaled $1,307,050, or 47 cents a share, compared with $1,458,529, or 53 cents a share, for the corresponding period in 1953.

Fibreglas Film Cases Ready

Film containers made of Fibreglas are scheduled for production this month by U. S. Fiberglass & Industrial Plastics, N. Y. City. The cases will weigh 5½ pounds, compared with 16 pounds for the metal containers now being used.

Finest Lenses Are Needed for New Projection Techniques...

THE ANSWER

Cinema Raptars

THE WORLD'S ONLY PERFECTLY MATCHED PROJECTION LENSES

Today with the new movie techniques—CinemaScope, Vista-Vision, Wide Screen—exhibitors must have the finest basic lenses in order to give theatre goers sharp, clear pictures from edge to edge of the screen. There are no finer projection lenses made than Wollensak Cinema Raptars. (For CinemaScope these lenses are used with anamorphic lenses.) Cinema Raptars use six and seven element construction. Only with such a design is it possible to deliver full speed, edge-to-edge sharpness, and highest resolution. In addition, Cinema Raptars are the world's only perfectly matched lenses—focal lengths matched to within .0025! Marked as matched (twin) lenses. Speed ranges are f/1.9 in focal lengths from 2" through 5" and f/2.0 to f/2.7 in focal lengths to 7" . . . priced from $180 each.

WRITE for new literature fully describing these new Projection Lenses. Wollensak Optical Co., Rochester 21. N. Y.

JUST PURCHASED NEW PROJECTION LENSES?

NEED ADJUSTMENTS FOR WIDE SCREEN?

WHAT TO DO WITH NON-ANAMORPHIC RELEASES?

Wollensak

VARI-FOCUS

a supplementary lens for all screen sizes

With the new Vari-Focus lens exhibitors can show all the current screen releases without buying a complete new range of short focus lenses. The Vari-Focus permits you to make adjustments for screen width . . . change the focal length of your standard projection lens quickly and easily. (See table.) The Vari-Focus is a supplementary lens which will produce any wide screen aspect ratio (non-anamorphic) when used in conjunction with a 3" to 6" projection lens. The resolution and picture quality will match those of the finest projection lens. Price $235 each.

Standard Lens	Variable Focus From
3"	2¼" to 1⅞"
3½"	2⅜" to 2"
4"	3¼" to 2¼"
4½"	3½" to 2½"
5"	4" to 3"
5½"	4½" to 3½"
6"	5" to 3½"

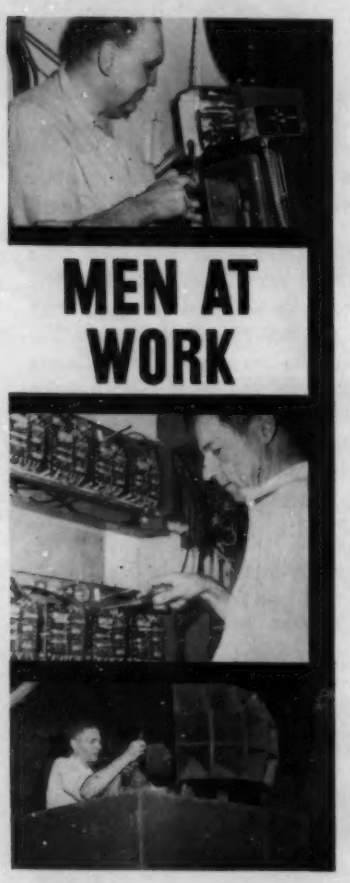
WRITE for new literature fully describing this supplementary lens. Wollensak Optical Co., Rochester 21, N. Y.

MASTERPIECES of Optical Craftsmanship by WOLLENSAK

C'Scope Demonstrations

A series of trade and press demonstrations shortly of an important filmed "progress report" on CinemaScope and stereophonic sound will be held in every exchange city in the United States and Canada, 20th Century-Fox has announced. Demonstrations will be arranged so as to rotate five prints on a 5-city day-and-date basis covering all exchange areas within a period of 10-days.

Leading exhibitors, executives from production and distribution newspaper publishers and editors will be invited by the company to see the advances effected in the process in the past year. The subject, completion of which is scheduled for mid-June, will run for more than one hour and will be in color. Footage will be narrated and will point up such advances as new "taking" lenses perfected by Bausch & Lomb. The reel will also present a full comparison of 4-track magnetic stereophonic sound and regular optical sound.



Altec service men . . . 200 skilled, sound-wise field engineers . . . Altec-trained technicians equipped with Altec-designed precision tools and instruments . . . at work in theatres from coast to coast . . . installing stereophonic systems . . . servicing . . . repairing . . . replacing . . . counseling exhibitors . . . solving difficult problems . . . assuring perfect performance day in and day out . . . for 6,000 Altec-serviced theatres!

You can put an Altec service man to work for you tomorrow. Let us show you how . . . today!

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Schedule Next TESMA Show

The next combined trade show of the Theatre Equipment and Supply Manufacturers Association, the Theatre Equipment Dealers Association and the Theatre Owners of America is scheduled to run from October 31 through November 3, 1954, at the Conrad Hilton Hotel, Chicago.

This next show will be extremely important, according to Walter Reade, Jr., president of the Theatre Owners of America. "The year 1954 is a 'year of decision' in the motion picture industry because the new developments in projection, sound and screens will come to a head and will govern our future investments and our future policies".

Film Equipment Exports in '53

Total exports of motion picture equipment, including cameras, projection and sound equipment, and studio equipment, were valued at $11,799,660, about 20% higher than 1952 exports valued at $9,826,921. Exports of motion picture cameras, sound recording and reproducing equipment, arc lamps, screens, and studio equipment registered increases in 1953, with the largest gains being exports of sound equipment and motion picture screens.

There was an increase in exports of motion picture projectors in all classes except 16-mm sound projectors: in 1953 such exports totaled 7,700 units valued at $2,572,821 compared with 10,092 units valued at $3,038,594 in 1952.

Fairchild Shipping Sound System

Shipments of Fairchild Perspecta stereophonic sound integrators have already been made to 15 countries. Fairchild is now in heavy production on the new stereophonic sound system which directs sound to three speaker channels from a single optical soundtrack. The integrator is the heart of the system.

Clayton Ball-Bearing Even Tension Take-Ups

For all Projectors and Sound Equipments

ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE

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Fred Waller Succumbs; Developer of Cinerama

Fred Waller, the man who brought on the new-process revolution in the motion picture business when he developed Cinerama, died last month at his home in Huntington, N. Y.

The 68-year-old inventor had been ill for some time and had been unable to go to Hollywood in March to accept an Academy Award for his development of the Cinerama process of "engulfing" the viewer and obtaining a 3-D effect by utilizing the full human angle of vision through projecting on a very wide screen curved almost to a half circle.

Inventions Numbered over 160

Waller preceded his motion picture discovery by more than 160 inventions in many fields, including a gunnery trainer used in this country and Britain during the second World War. Air Force officials once estimated that the gunnery invention, which was also an application of the Cinerama principle, prevented 350,000 casualties.

Born in Brooklyn, N. Y., Waller was attending Brooklyn Polytechnic Institute when he left school at the age of 14 and went to work in his father's photographic studio. He was connected with the motion picture industry for 40 years as a photographer, research technician and producer.

A fellow of the SMPTE, he also was affiliated with many other technical organizations, including the IA cameramen.

Vectograph Experiments

Work is now being carried on at the Technicolor laboratories on the West Coast to make possible the printing of full-color 3-D movies using the Vectograph material patented by the Polaroid Corp. If Vectograph is adapted to films, exhibitors will be able to show 3-D pictures on one projector without making any change or additions in their standard projection-room equipment.

Vectograph images are processed with polarizing dyes and therefore require no polarizing filters at the projection ports. The process makes it possible to print two images on the same film strip. Both images are full-frame; one is printed on the emulsion side and the other on the base side. The Vectograph process makes it possible for one oppositely polarized image to be projected through another. This has the added advantage of assuring perfect synchronization and alignment.

Movie Audience Is Changing

Regular customers, who formerly accounted for 52% of a theatre's business, today are responsible for less than 20%, and that situation cannot be corrected until Hollywood's total production is increased to 425 or 450 pictures a year, says Trueman T. Rembusch, former prexy of the National Allied exhibitor group.

Briefly, Rembusch's viewpoint is that frequent changes of bill and more pictures with strong box office pull are required to provide the momentum that will keep regular patrons coming back to the theatre.

Theatre Tv to Offer Opera

A deal between the Metropolitan Opera in New York City and Theatre Network Television, that will make an unusual opening night program of the Metropolitan available to theatres

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DRIVE-IN and LARGE INDOOR THEATERS

The **HT 135** TransVerteR®

for **135** ampere ARCS

Type HT 135/270 TransVerter for 115 to 135 amperes, 63 to 70 volt high-intensity and spot arcs, and the new 135 lamps.

The *new* HT 135/270 TransVerter answers the need for 115 to 135 ampere arcs for all types of wide screen and 3D pictures requiring more light over a larger area. This latest Hertner TransVerter rounds out our line of dependable power units designed especially for arc lamps. Complete installation includes our Control Panel Type G and the new Dual-type HD 100/140 Rheostat.

For all the details of the many fine features of the new HT 135 TransVerter write for Bulletin No. 3018.

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One push to left or right and all cues are made in 16- and 35-, Standard, Tv, or CinemaScope

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throughout the country over theatre Tv, has been announced.

Instead of a single opera, a four-part program, "Great Moments from Great Operas," will be presented, including scenes from "Pagliacci," "La Boheme," "Aida" and "Barber of Seville." TNT has signed a three-year contract with the Met for the opening night telecasts, which will take in not only the opera but the audience, and the lobby festivities that usually mark the event.

RCA Stereo Sound Booklet

Stereoscope sound systems designed specifically for reproduction of four-track magnetic film are described in the new multi-colored folder issued by the Radio Corp. of America. The well illustrated text offers data on the magnetic head cluster, amplifiers, sound speakers, complete projector assemblies and the featured button-on soundhead with soft-loop film system. Form 2R8932 is available from the Engineering Products Div., Camden, N. J.

Canada Using Fewer U.S. Films

Figures on imports of films to Ontario, Canada, during 1953 show a drop in the number of American motion pictures brought into that province and a rise in the number of imports from other nations.

It was estimated that 437 American films were imported during a 1952-53 fiscal-year period, while only 401 were imported during the same period in 1953-54. A total of 59 pictures were imported from countries other than the U. S. in 1952, compared with a rise to 109 during 1953.

Video to Reach Australia

The Royal Commission, which has been studying Tv possibilities for Australia, recommended recently that it be inaugurated as soon as possible, with initial stations proposed for Sydney and Melbourne.

IA ELECTIONS

LOCAL 182, BOSTON, MASS.

Joseph Caplan, *pres.*; Frank Sullivan, *vice-pres.*; James Gibbons, *rec.-sec.*; Benjamin Bearman, *fin.-sec.*; Ralph Frazier, *bus. rep.*; Jack Rosenberg, *treas.*; Michael Keller, *trustee*; Morris Goldman, Frank Laby, Henry Gleken, *exec. board*; Alexander Tradd, Henry Perry, Fred Jones, Albert Goldman, Morris Myers, *sen. board*; Walter Diehl and Joseph Nuzzolo, Sr., *del. IA Convention.*

LOCAL 3, PITTSBURGH, PENNA.

Ralph Quinn, *pres.*; Vincent Coll, *vice pres.*; John Shelton, *sec.*; Julius I. Drobb, *treas.*; Philip J. Doyle, *bus. rep.*; Edward McGrath, *trustee*, and Raymond Steinecker, *sgt.-at-arms.*

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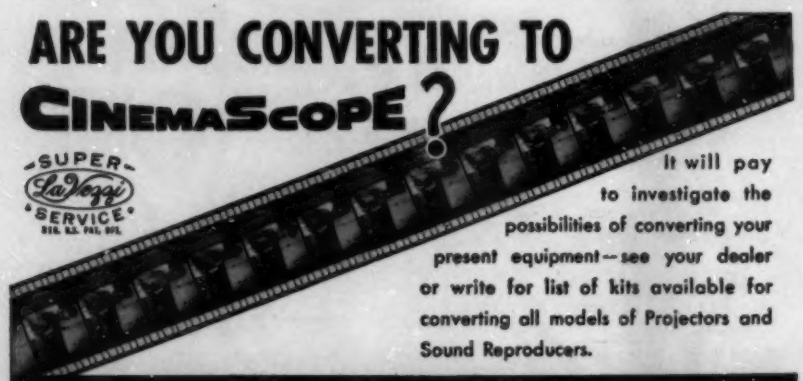

It will pay to investigate the possibilities of converting your present equipment—see your dealer or write for list of kits available for converting all models of Projectors and Sound Reproducers.

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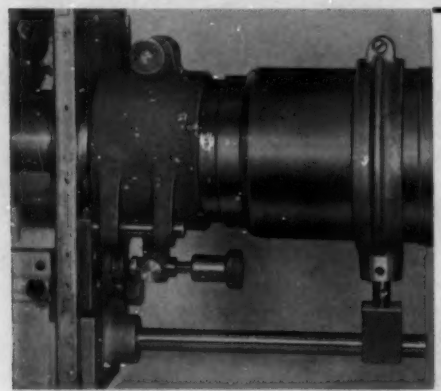

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Anamorphic and 4" Type

Wenzel Pro 50 and Pro 4.
Regular Rear Shutter Simplex,
Super Simplex and E-7 type Projectors,
Ballantyne "B" & "BW",
can be easily converted to use the 4" Projection Lens.

ALSO AVAILABLE:
Anamorphic Lens Supports, Large or Small, for all above mentioned Projectors and Century C & CC models.

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WENZEL PROJECTOR CO. 2505-19 S. State St., Chicago 16, Ill.

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The NEW HI-LUX SCREEN has reached a state of perfection that will meet the most *EXACTING PROJECTION* requirements

1. SEAMLESS CONSTRUCTION
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ONE DOWN—MORE TO GO

(Continued from page 8)

Significant as were the technological developments during the past month, IP feels that further readjustment of distributor policy and technical standards is in the offing, but these will be forthcoming only if persistent pressure favoring such changes is applied.

Summing up, IP hails the switch in 20th-Fox policy so that thousands of additional theatres may play its badly needed product without going in hock for unnecessary equipment; it questions the necessity for stereophonic sound reproduction in the vast majority of theatres, even while it expects great improvement in the application of this medium, especially with respect to the acute need for intelligent control of volume in the theatre; it still disapproves of any aspect ratio higher than 2-to-1; it still is and will continue to be unalterably opposed to curved screens; it believes that the VistaVision process of an extended negative reduced to a positive frame of a sane aspect ratio that may be projected without the aid of claptrap "attachments" and with standard projection lenses still is the best bet for the exhibition field.

Overall, IP is not exultant anent the results stemming from its lone press battle against those policies which it considered inimical to the best interests of the exhibition field, in which sphere its readers move. On the contrary, it is a bit sad that these developments did not occur many months ago, as they could have, and thus spared the industry incalculable economic loss and, on the part of exhibitors, much personal grief.

The fight for technological sanity is far from won. The next, the inevitable step must of necessity be the establishment of technical standards which will enable the industry as a whole to go on and to preserve at the least its present economic status.

Photo of calibrated optical device which enables the projectionist to pre-focus a variety of lenses. As published on page 10 of the April, 1954 issue of IP, this device, designed by Joe Tritsch, of IA Local 150, Los Angeles, was shown in an inverted position. Here is the correct view. (Excuse it.)

Tv Color Quality Improved

A "color multiscanner," an electronic device designed to perfect the quality of television images transmitted from 16-mm color film, was demonstrated recently by DuMont Laboratories.

The device is said to achieve increased color brilliance over color Tv circuits by means of electronic masking system which allows the broadcasting studio to vary the saturation of colors as well as the brightness of the picture.

50 Drive-ins Get Stereosound

About 50 drive-ins in various parts of the country had been equipped with stereophonic sound as of last month, says 20th Century-Fox.

SELECTIFIERS

SELECT-A-VOLTAGE SELENIUM RECTIFIERS

"Superior" & "50,000 Hour" types, 50 to 400 Amps, rugged, oversized, selenium stacks. Adjustable-in-use glass insulated transformers. Operate continuously in any climate, at standard or heavy overloads at maximum efficiency on both "Suprex" and H.I. Arcs. "Selectifiers" sell themselves on obvious quality and dependability.

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NORPAT, INC.
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ACE REEL-END ALARMS

The only ball-bearing reel-end alarms
Never fails—all sizes from 16" to 26"
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"MOVIES ARE BETTER THAN EVER" WITH
NEW f/1.8 SUPER-LITE HILUX

FILLS YOUR SCREEN
with the brightest clearest picture *YET!*

★ NEW ANASTIGMAT FORMULA
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ANATOMY OF C'SCOPE

(Continued from page 13)

blessing to this tired old industry by reviving public interest in moviegoing. Continued success of the movies will not be due to either 3-D or CinemaScope, however, and certainly not the 20th's policy of whittling the number of releases to the vanishing point. Other major producing companies, notably Paramount, realize that the screens of small-town and neighborhood theatres must be supplied with pictures—*standard* pictures—if the industry is to survive. The absence of technological standards for the new processes is an industry disgrace.

Hollywood Exaggeration

With the exception of "The Robe," a phenomenally successful curiosity, CinemaScope grosses are no better than the "take" of the many really good normal pictures on the screens of American theatres. The secret of a successful motion picture industry is good pictures, not weird aspect-ratios.

So while we gather a bunch of posies to award to 20th for stirring up interest in movies, let us slip in a note of disapproval for unwarrented monkeying with film standards. There is no valid reason why CinemaScope should have been scaled to require an off-standard projector aperture or smaller perforations. There is little justification for using curved aluminum screens. That CinemaScope is itself distorted by screen-curvature is a small matter in comparison with the distortion of regular pictures shown on these screens.

Most exhibitors who have CinemaScope screens have no way of removing them for regular projection. As a result, conventional pictures, which have up to now been nearly perfect from the pictorial point of view, have been mishandled. In many theatres, the standard short subjects on CinemaScope programs have actually been projected with the oversized CinemaScope aperture. The writer has listened to many patron complaints on this score without asking for them.

Sloppy Technology

Worse still, exaggerated aspect-ratio apertures and excessively short-focus lenses are being used for projecting standard films on seamy, aluminized "wide screens." In fact, this wretched mode of presentation is actually being advertised by exhibitors as an attraction! Well, the public just isn't attracted by masked-off, distorted, seam-marred projection. One or two experiences with that sort of thing is quite enough.

So for the first time in the history of the business, small theatres in the neighborhoods actually have better projection than the superdreadnaughts. And people are beginning to "shop" for theatres where standard, undistorted projection of high quality prevails. The many excellent movies to be seen nowadays *are* being seen in the increasingly prosperous smaller theatres.

The standard 3:4 format *on a sufficiently large screen* which is flat and which is white is still the preferred manner of presenting motion pictures. While CinemaScope is indeed a Godsend for the producers of "spectacles" and travelogues, the more subtle and adult emotional dramas just can't get across the width of the wide screen.

[THE END]

MONTHLY CHAT

(Continued from page 5)

from the sprocket hole areas and wider magnetic film coatings are employed."

The magnetic filings on the film are nothing but emery, which if introduced into the motion picture reproduction process only a few years ago would warrant the opprobrium of both engineering and exhibitor circles. Today, however, with magnetic stripings the vogue, it seems that Messrs. Engineer and Exhibitor beam upon the projectionist for introducing this substance which is utterly foreign to the satisfactory operation of a precise mechanism.

We have seen emery introduced into a gear train for the sole purpose of discrediting the premiere performance of a new soundhead in a Broadway theatre; but we never expected to see the day when the deposition of this substance over the entire projector mechanism (ignoring for the moment the factor of head wear) would be acclaimed as a significant engineering advance.

So far as IP is concerned, we state that sound reproduction *via* the single optical track, plus an integrator which shunts the sound to a multiple-horn installation, is wholly acceptable to the average auditor. In fact, it is a higher quality sound than is available from even the finest radio or Tv set now on the market. When people talk about "high-fidelity" sound, we always pose this question: "In what manner is the sound recorded, and what is the cut-off frequency?" The solution to many of our present difficulties may be readily resolved by an honest answer to this query.

Todd AO Picture Shooting Sked

"Oklahoma," the first picture to be filmed in the 70-mm Todd AO process is expected to be photographed at the M-G-M studios in Culver City, starting this month.

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